The usage of data in NHS primary care commissioning: a realist synthesis and evaluation

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Abstract

Against a backdrop of a rapidly ageing population facing increasingly complex health challenges, policy-makers have encouraged primary care commissioners in the NHS to increase the usage of data (a form of evidence that can be expressed in numbers) to inform commissioning decisions, i.e. to conduct evidence-based commissioning. The purported benefits of doing so are vast, including the achievement of cost savings as well as improved population health outcomes. However, the limited existing research on evidence-based commissioning has emphasised the complicated and complex contexts commissioners work in and argued that closer attention should be paid to the role of context in facilitating and inhibiting the usage of evidence. The aim of this thesis was to use realist approaches, which have an explanatory rather than a judgemental focus, aiming to understand how, why, for whom, to what extent and in what circumstance interventions and programmes work. My research objectives were to understand: (1) How and why do commissioners use data to inform commissioning, and what outcomes does this lead to? (2) What factors or contexts promote and inhibit their usage of data in commissioning decisions?

I used a multimethod qualitative approach, drawing on three sources of secondary and primary data, namely a realist synthesis (systematic review), interviews with commissioners and academic experts on commissioning, as well as recordings of primary care commissioning meetings. I employed an iterative convergent (concurrent) approach to allow the evidence from these three sources to 'talk to each other' during the analysis phase, meaning the findings from the three sources were compared and considered, ultimately forming a set of consolidated configurations about how commissioners used data, and the contexts that promoted and inhibited this. These findings were grouped into four conceptual categories related to commonalities across the contexts impacting how commissioners used (or were prevented from using) data: (1) steps of the commissioning cycle, (2) characteristics of data, (3) commissioners' capabilities, roles, perceptions, and intentions, and (4) commissioners' relationships with external providers of data (analysis).

The novelty of this DPhil lies in its exclusive focus on one form of evidence (data) in the process of primary care commissioning, the application of a realist lens to analyse this, as well as the amount of secondary and primary data gathered and analysed. I found that commissioners use data not only as a form of evidence to inform commissioning decisions, but also as a tool to stimulate commissioning improvements, and as a warrant for convincing others about decisions they wish to make. However, despite being well-intentioned users of data, commissioners face considerable challenges when trying to use them. Commissioners have developed a range of strategies to deal with 'imperfect' data, but there are still considerable barriers that inhibit data from being used in certain contexts. Understanding and addressing these will be key in light of the government's ongoing commitments to using data to inform policy-making, as well as increasing integrated commissioning.

Glossary

APMS	Alternative Provider of Medical Services
BI	Business Information
CCG	Clinical Commissioning Group
CMO	Context, Mechanism, Outcome
COPD	Chronic obstructive pulmonary disease
CQC	Care Quality Commission
CQRS	Calculating Quality Reporting Service
CSU	Commissioning Support Unit
CUREC	Central University Research Ethics Committee
DES	Directed Enhanced Service
EBM	Evidence-Based Medicine
EBPH	Evidence-Based Public Health
ECG	electrocardiogram
EMIS	Egton Medical Information Systems
GIRFT	Getting it Right First Time
GMS	General Medical Services
GP	General Practitioner
HA	Health Authority
HES	Hospital Episode Statistics
HSCA12	Health and Social Care Act 2012
ICB	Integrated Care Board
ICP	Integrated Care Partnership
ICS	Integrated Care System
LCS	Locally Commissioned Service
LD	Learning Disability
LES	Local Enhanced Service
NES	National Enhanced Service
NHS	National Health Service
NHSE	NHS England
NICE	National Institute for Health and Care Excellence
NIHR	National Institute for Health and Care Research
PBC	Practice-based commissioning
PCG	Primary Care Group
PCN	Primary Care Network
PCT	Primary Care Trust
PMS	Personal Medical Services
PPI	Patient and Public Involvement
QALY	Quality-Adjusted Life Year
QOF	Quality and Outcomes Framework
RAMESES	Realist And Meta-narrative Evidence Syntheses: Evolving Standards
RCT	Randomised Controlled Trial

SIRMS	Safeguard Incident and Risk Management System
STPs	Sustainability and Transformation Plans
TPPs	Total Purchasing Pilots

List of figures

Figure 1 - overview of Brownson et al's and Allen et al's definitions of quantitative evidence 27

Figure 2: summary of steps constant comparison method & matrix 110

Figure 3: PRISMA diagram 118

List of tables

Table 1: initial programme theory with potential incomplete CMO configurations 54

Table 2: Overview of meeting content transcribed and analysed 75

Table 3: Overview of interviews with PPI contributors 83

Table 4: commissioner interviews 91

Table 5: Overview of interviews completed with experts on evidence-based commissioning 98

Table 6: annotation matrix 106

Table 7: examples of annotation matrix 108

Table 8: study types, realist synthesis 116

Table 9: Overview of included studies 120

Table 10 key for CMO matrix 161

Table 11 CMO matrix 162

Table 12 Overview of substantive theories used to inform CMO development 165

Table 13 CMO 1 171

Table 14 CMO 2 174
Table 15 CMO 3 178
Table 16 CMO 4 183
Table 17 CMO 5 187
Table 18 CMO 6 189
Table 19 CMO 7 190
Table 20: CMO 8 196
Table 21 CMO 9 198
Table 22 CMO 10 200
Table 23 CMO 11 202
Table 24 CMO 12 205
Table 25 CMO 13 208
Table 26 CMO 14 211
Table 27 CMO 15 213
Table 28 CMO 16 214
Table 29 CMO 17 217
Table 30 CMO 18 218
Table 31 CMO 19 220
Table 32 CMO 20 223
Table 33 CMO 21 226
Table 34 CMO 22 231
Table 35 CMO 23 234
Table 36 CMO 24 236
Table 37 CMO 25 239

Table 38 CMO 26 241
Table 39 CMO 27 243
Table 40 CMO 28 245
Table 41 CMO 29 246
Table 42 CMO 30 248
Table 43 CMO 31 249
Table 44 CMO 32 250
Table 45 CMO 33 253
Table 46 CMO 34 255
Table 47 CMO 35 258
Table 48 CMO 36 260
Table 49 CMO 37 263
Table 50 Comparison of CMOs across evidence sources 265

1. Introduction, background, and context

I begin this chapter by summarising my personal background and how I developed an interest in commissioning and evidence use in health policy. Thereafter, this chapter introduces the concept of evidence-based policy making. I then describe the history of the commissioning of primary care services in the English NHS by outlining the key legislative and policy developments impacting the commissioning of primary care services and GP contracts and provide an overview of the purported benefits of using (more) evidence to inform the commissioning of primary care services. I define the terms ‘evidence’ and ‘data,’ and provide my rationale for the sole focus on data in my thesis. I also describe adjacent policy fields (e.g. evidence-based healthcare) as well as the broader policy context and show how these are linked to my research. I provide a summary of the current literature on the usage of evidence in commissioning and explain how my thesis will add to and address existing gaps in the literature. I state my research questions, and provide an overview of the structure of my thesis.

1.1 Introduction and personal background

I became interested in the NHS and commissioning while working at a consulting firm in London after completing my undergraduate degree. When I began working there, I was initially less interested in working on projects with public sector clients, and, truthfully, like many young consultants, considered working with the private sector to be more exciting and dynamic than with the supposedly staid public sector. However, new graduates were not always given much choice regarding the projects: within a few months, I found myself working on a procurement project at a struggling

NHS Trust. One of the tasks I was given was compiling a profile of the local area, including data on demographics and poverty, and evaluating how this was impacting the Trust and its operations. This piqued my interest in the interplay between demographic and epidemiological factors and the healthcare system. I later worked on a project with a local council to develop a commissioning strategy, which included conducting a large amount of analysis of the local population and attempting to work out how the council could plan and commission health services against a backdrop of increasing financial pressures. I was fascinated by the different types of data that could be used to inform the development of such a strategy, including census and indices of multiple deprivation data, as well as data on housing and education. I spent several months trawling the internet for data and using different types of maps and software to visualise and analyse them. I knew I wanted to learn more about using evidence, in particular data, to inform and improve health policy.

I left consulting in 2017, initially to take a sabbatical and pursue an MSc in Evidence-Based Social Intervention and Policy Evaluation. I enjoyed being back at university, and had always had the idea of pursuing a PhD at the back of my mind that I wanted to do a PhD that was based on a very applied and practical research question that drew on my practical experience of working in procurement and commissioning, and that would enable me to work in the fields of health policy and health services research in the future. Whilst having some experience of working with the NHS and in commissioning did help me develop my research questions and gave me an initial insight into how public sector bodies might use data to inform policy, my experience of interacting with the NHS prior to commencing this research had left me with some preconceived assumptions, especially around how the NHS viewed external

consultancies and the sophisticated new datasets and tools it seemed to be regularly inundated with. I had to re-examine and unpick these notions throughout my research and be mindful of these biases impacted my research.

1.2 Evidence-based policy making

1.2.1 Background, definition, and purported benefits

Evidence-based policy making is sometimes said to have derived from Evidence-Based Medicine (EBM), dating back to at least 1972, when Cochrane's work 'Effectiveness and Efficiency: Random Reflections on Health Services' was published.[1] For Cochrane, the purpose of EBM was to achieve the abandonment of ineffective and harmful interventions and adopt interventions effective for achieving clinical outcomes by utilising findings from certain types of evidence, e.g. meta-analyses.[1] The New Labour government was elected in 1997 with a manifesto proclaiming 'what matters is what works,'[2] and committed to use evidence-based policy making and service delivery.[3]

Although evidence-based policy making is seldom defined explicitly, one such definition has been provided by Plewis: the need to support policy with research evidence, and that trials of policies should be evaluated as rigorously as possible.[3,4] Having greater access on what works can lead to more effective use of resources, improve the likelihood of implementing interventions, whilst non evidence-based decisions could be ineffective or detrimental to public health.[5] Evidence-Based Public Health (EBPH) can lead to numerous benefits including a higher likelihood of successful programmes and policies, more workforce productivity, and a more efficient usage of private and public resources.[6]

1.2.2 Critiques of evidence-based policy making

The concept of evidence-based policy making and the notion that the usage of evidence will improve policy outcomes are not uncontested. Some critics note that there is limited empirical analysis showing that evidence utilisation actually leads to better outcomes.[1] Others argue that the concept of evidence-based policy unduly elevates the role that 'science' can play in solving societal problems, and that a focus on evidence-based policy can erode policy-makers' confidence in their ability to make judgements by marginalising other forms of information such as experience and tacit knowledge.[7] A further critique is that supporters of evidence-based policy may implicitly assume that policy making should be as 'evidence based' as medicine (where there may be a clinically 'best' or 'safest' option), but this may be at odds with the aim of politics, which is to translate competing societal values and preferences into policy solutions.[8]

1.3 Overview of commissioning in the NHS

1.3.1 Definition of commissioning

Within the NHS, commissioning refers to the proactive and strategic process of planning, purchasing, contracting, and monitoring of health services to meet population health needs.[9,10] The NHS's own model of the commissioning cycle consists of three recurrent activities, each further divided into sub-activities:[11]

1) Strategic planning (assessing needs, reviewing current service provision, deciding, and agreeing priorities)

2) Specify outcomes and procure services (specifying and agreeing quality outcomes, designing services and pathways, contacting with providers, and shaping the structure of supply)

3) Monitoring: managing demand, supply, and performance (managing quality, performance and outcomes, clinical decision making and managing demand)

The NHS has defined tools, capabilities, and evidence (including data) that can be used to underpin and inform each of these steps.[11] However, studies on commissioning have concluded that commissioning often does not follow a neat, predictable cycle, and described the process as ‘messy and fragmented’, with some activities taking years to complete.[10,12]

1.3.2 Definition of primary care commissioning

From the inception of the NHS in 1948 to 1990 there was limited local planning and oversight of GP services: GPs were individual contractors and payments to them were governed by the number of patients they had and the services they provided.[13,14] In 1991, NHS reforms established an ‘internal market’ separating purchasers (Health Authorities (HA) and GP fundholders) and providers (hospitals and providers of community health services) of health care.[15] The aim of this split was to achieve efficiencies and enable purchasers to use contracts to create incentives for the provision of effective treatments, as well as reduce spending on unproven interventions.[15]

From 1991 to 1998, a scheme called GP fundholding allowed volunteer GP practices to receive budgets to purchase specific community health, outpatients, and elective

hospital care services, as well as assume financial responsibility for their prescribing activity, with the possibility to invest savings in their practices.[16-18] In 1995, Total Purchasing Pilots (TPPs) began, an extension of GP fundholding, whereby fundholding practices were given a delegated budget to purchase practically all services for their patients.[19] In 1997, the government announced plans for piloting new approaches to the commissioning of health services, and in 1998 launched 40 general practitioner commissioning pilots, whereby GPs assumed a wide range of commissioning responsibilities, including hospital and community health services budgets, and elements of general medical services budgets.[20] In December 1997, the government announced its intention to develop a national network of Primary Care Groups (PCGs), and used lessons from an evaluation of the pilots to facilitate the establishment of PCGs.[20] The New Labour government established PCGs in 1999, responsible for commissioning a full range of services in a geographic area, including being given a budget covering GP prescribing and practice infrastructure.[17,21,22] The NHS Plan, published in 2000, stated all PCGs would become Primary Care Trusts by 2004, a new institution that would be given responsibility for commissioning all services for a geographical population.[13,21] PCTs were encouraged to introduce competition, actively procure services to fit the population's need, and shape the supply in their area.[14,23]

In parallel, changes were being made to GP contracts with a similar focus on increasing flexibility and promoting competition. In 1990, a new GP contract known as the General Medical Services (GMS) contract was introduced, which sought to influence GP behaviour by introducing targets for some services e.g. vaccinations and cervical smears, whereby GPs only received payments if they met a

prespecified target.[14] The 1997 National Health Service (Primary Care) Act introduced Personal Medical Services (PMS) contracts, allowing individual GPs or groups of practices to negotiate novel site-specific arrangements for providing primary care, with a view to increasing flexibility and improving service provision.[24,25] In 2004, a further type of contract was introduced, namely the Alternative Provider of Medical Services (APMS) contract – this enabled commercial, for-profit (or 'non-traditional') providers to tender for NHS-funded GP services, resting on the assumption that increasing competitive pressures on traditional GP practices could improve performance.[14,26]

In 2004, a new GMS contract was introduced which included a basic payment as well as additional payments for meeting quality thresholds (as part of the Quality and Outcomes Framework or QOF) and providing 'enhanced services' including:

- DESs (Directed Enhanced Services): agreed on a national level and must be offered by all GP practices in England
- LESs (Local Enhanced Services): developed by local commissioners to meet local needs
- NESs (National Enhanced Services): services commissioned from a GP practice using national specifications[14,27]

In 2010, the Coalition government introduced the Health and Social Care Act 2012 (HSCA12) which replaced PCTs with new commissioning organisations known as Clinical Commissioning Groups (CCGs), which were given responsibility for commissioning most health care services and were membership organisations with

GP practices as members.[28] The commissioning of all primary care services (GP services, dental, eye and pharmacy services) was originally given to a new national organisation called NHS England (NHSE), since the government believed it would create a conflict of interest for an organisation with GPs as members to commission primary care services.[28,29] However, this effectively meant that there was a fracture in the commissioning of primary care services, since 'enhanced services' were commissioned by CCGs, and there was overlap between the 'core' GMS contract and PMS contracts commissioned by NHSE.[14]

In 2014, it was announced that CCGs were to be given new powers to take on a greater role in commissioning GP primary medical care services (i.e. dental, eye and pharmacy services would continue to be commissioned by NHSE) from April 2015, allowing for a more integrated approach to commissioning.[14,30] Three options were made available to CCGs:[14]

- 'Greater involvement' – CCGs have influence but don't take the lead in shaping primary care.
- 'Joint commissioning' – CCGs would set up joint committees with NHSE regional teams to share commissioning of primary care services responsibility, but funding would remain with NHSE finance, so they remained party to all decision making.
- 'Delegated authority' – Delegated commissioning provides CCGs with full responsibility for the commissioning of general practice services.

By 2016/2017, 115 CCGs (out of 209) had moved towards delegated commissioning arrangements.[13] As of April 2021, all CCGs had delegated commissioning arrangements for GP primary medical services.[31] After several years of locally-led development, the 2022 Health and Care Act established 42 Integrated Care Systems (ICSs) in England and abolished CCGs.[32,33] ICSs are partnerships of NHS organisations that plan and deliver joined up health and care services for a given area.[32,33] ICSs comprise Integrated Care Boards (ICBs) and Integrated Care Partnerships (ICPs), with ICBs responible for planning and funding most NHS services in a given area.[33] 42 ICSs were established in England in July 2022, with ICBs taking on commissioning responsibilities, including the commissioning of primary care and a number of specialised services.[33,34]

In the context of this study, commissioning of primary care services includes the following activities. These are based in part on NHS England's 'Delegated commissioning model-draft terms of reference'[35], as well as the primary care services mentioned in the meeting minutes and recordings that I analysed during the primary data collection phase:

- Commissioning of GMS, PMS and APMS contracts (including the design of PMS and APMS contracts, monitoring of contracts, taking contractual action such as issuing branch/remedial notices, and removing a contract);
- Newly designed enhanced services ('Local Enhanced Services' and 'Directed Enhanced Services');
- Design of local incentive schemes as an alternative to the Quality Outcomes Framework (QOF);

- Decision making on whether to establish new GP practices in an area;
- Approving practice mergers;
- Making decisions on 'discretionary' payment (e.g., returner/retainer schemes);
- Planning, including needs assessments, of primary care services in the local area;
- Undertaking reviews of primary care services in the local area;
- Co-ordinating a common approach to the commissioning of primary care services generally;
- Managing the budget for commissioning of primary care services;
- Prescribing and medicines management;
- The commissioning of eye, dentistry, and optometry services;
- The commissioning of pathways that include a portion in primary care. For example, a diabetes pathway that includes care in general practice (i.e. primary care) would be considered within the scope of this project.

This thesis is about the commissioning of primary care services' (as listed above) and not 'primary care commissioning.' The term 'primary care commissioning' is used in the literature to refer to *both* commissioning by primary care clinicians, also known as clinically led or primary care-led commissioning, e.g. making GPs (who are primary care clinicians) responsible for commissioning services, including those outside of primary care such as hospital services, *as well as* the commissioning *of* primary care services.[13] This thesis focusses on the latter type, i.e.

services related to primary medical care provided mainly by GPs. To facilitate the ease of reading, I use the term ‘commissioning’ instead of ‘commissioning of primary care services’ as well as ‘commissioners’ rather than ‘commissioners of primary care services’ throughout the DPhil.

General practice has been described as the bedrock of the NHS: it accounts for 90% of patient consultations with about 8% of the NHS budget.[36,37] GPs prevent overuse of other more expensive health services, and enable the NHS to provide cost effective treatments.[36,38] However, primary care has faced significant challenges over recent years, including high stress among GPs, falling numbers of GPs as a proportion of NHS doctors, and a decreasing share of NHS funding.[36] The NHS five year forward view (2014) set out to give CCGs more influence and supported a shift in investment from acute to community and primary care services.[29] Primary care commissioning strategies can facilitate the delivery of integrated care programmes such as Sustainability and Transformation Plans (STPs) and help ensure health and care services are built around population needs.[39] Primary care commissioning is integral to the sustainability of the NHS, as set out in a letter to CCGs from the NHS in 2014 asking them to consider additional responsibilities:[28]

> *‘So today I am inviting those CCGs that are interested in an expanded role in primary care to come forward and show how new powers would enable them to drive up the quality of care, cut health inequalities in primary care, and help put their local NHS on a sustainable path for the next five years and beyond.’*[40]

1.4 Current legislation and policy on evidence-based commissioning

Within the English NHS, those charged with delivering evidence-based policy making include commissioners in CCGs.[41] Commissioners in CCGs have access to a wide range of evidence, including written guidance, directives, reports, surveys, articles and data, as well as more informal evidence such as stories and conversations.[42]

The NHS has introduced legal requirements as well as practical support to promote evidence-based commissioning. The 2012 Health and Social Care Act created a statutory duty for CCGs to promote the usage of evidence obtained from research and mandated that research use should be a core consideration in health services commissioning.[43,44] A programme to promote evidence-based commissioning was created in 2013 in the West of England as part of the work of a newly formed Academic Health Science Network (WEAHSN), aiming to support CCG staff with evidence uptake through establishing new roles focused on supporting the uptake of evidence in CCGs as well as a training programme to help build a culture of evidence and evaluation.[45] NHS England established Data Services to ensure that information about the performance and impact of NHS services was available to commissioners of health services.[46] In addition, NHS England has created numerous guides and toolkits to promote and facilitate evidence-based commissioning.[44,47] Examples of these include e.g. NHS RightCare and the NHS Atlas of Variation in Healthcare, which contain various types of variation data including spend and prescribing data.[48,49]

1.5 Overview of literature on the usage of evidence in commissioning and the importance of context

1.5.1 Literature on the usage of evidence in commissioning

There is limited research on the usage of evidence and decision making in UK healthcare commissioning.[9,45] A common theme in the existing research is that evidence use in commissioning decisions is a multifaceted and complex process that can vary by person and context, and that evidence is not always used to inform decision making. For example, a survey conducted across 11 PCTs between 2010 and 2011 found that 50% of healthcare decisions made by commissioners were not based on clinical evidence, and 50% were not based on the consideration of cost-effectiveness of the available options.[50] A logistic regression showed that several demographic traits were significant predictors of the importance assigned to the use of empirical evidence: female respondents were more likely to report a higher importance of empirical evidence to inform commissioning decisions compared to males, and respondents working in finance and other departments were less likely to report using empirical evidence compared to their Public Health colleagues.[50] One study described the 'art of commissioning' as a process in which policymakers sought information in myriad ways, including to identify options, justify decisions, and convince others, and that 'evidence-based policy making' consisted of the pragmatic selection of 'evidence' such as best practice guidance, clinicians' opinions and that national or research-based evidence was not always considered the most useful.[41] A study of commissioning a new diagnostic technology for peripheral arterial disease in primary care concluded that commissioning should be understood as an evolving

and contingent process in that it is constantly defined and redefined in different contexts.[9]

1.5.2 The role of context in the usage of evidence in commissioning

A recurring conclusion of such research was that more attention should be paid to the role of context if evidence use among commissioners is to be increased. One study concluded that researchers made 'little effort' to understand the context commissioners work in, and that researchers (or evidence-producers) may have to adapt the way they supply evidence if commissioners are to use more of it, since much of the literature on evidence-based policy making focusses on the barriers to research utilisation from the perspective of researchers.[41] Several NIHR-funded studies of commissioning have consistently shown that commissioners' work is contextually contingent.[42] One studied evidence use across eight CCGs, concluding that further research was needed to understand the nuances and caveats of the contexts impacting evidence use.[51] The study on the peripheral arterial disease pathway noted that a limitation of their study was focussing on a single innovation, and the future research had scope to check if the tensions identified, which included tensions between national priorities and rapidly changing local population needs.[9]

1.6 Potential interventions to increase the usage of evidence in commissioning

There are several potential interventions to increasing the usage of evidence in commissioning of primary care services. For example, commissioners could simply be given access to more evidence, but such interventions have not always been

effective. In a controlled before and after study of CCGs, researchers found that access to a demand-led evidence briefing service (whereby some CCGs received on-demand access to an evidence briefing service) did not increase commissioners' use and uptake of research evidence compared with less intensive and less targeted alternatives.[52] This is redolent of critiques of the 'pipeline' model of research utilisation, which suggests that providing more research and evidence to policy-makers will not necessarily result in more use of it.[1]

Another potential intervention to increase commissioners' usage of evidence is the model of 'researchers in residence', wherein researchers embed themselves in a practice environment and co-produce knowledge with practitioners – an evaluation of such a model in three contexts, including commissioning groups, concluded that it had potential to produce knowledge that could be used in practice, but challenges remained, including how best to embed researchers in their host environment and the development of relationships between researchers and knowledge users such as commissioners.[53]

1.7 Definition and delineation of the terms 'evidence' and 'data' in this thesis

1.7.1 Definition of evidence and the delineation of qualitative and quantitative evidence (data)

Evidence can be defined as any form of information that can be used for making judgements or decisions.[6] There are different views on what constitutes best quality evidence, suggesting that the utility of evidence may vary by stakeholder and

context.[6,54] Brownson et al state that evidence can broadly split into quantitative evidence (data in numerical quantities) and qualitative evidence.[55] Examples of quantitative evidence include data from public health surveillance systems, evidence from Cochrane reviews, and surveys, whereas qualitative evidence involves nonnumerical observations including interviews, focus groups, and observations.[55] Brownson et al do not differentiate between primary and secondary forms of evidence, e.g. they state that quantitative evidence can include 'data from public health surveillance systems' as well as evidence in peer-reviewed journals.[55] The former would likely be more akin to what others call 'primary' data or evidence, i.e. content that has not yet been analysed or given meaning and is currently a set of 'raw' numbers, whereas the latter is likely more akin to what others call secondary or already analysed data or evidence, i.e. content that has already been subject to some degree of meaning or interpretation by others (see section 1.7.2 for further detail). A further, similar way to categorise this split is to contrast 'narrative evidence' based on e.g. case stories or examples of individual people with quantitative or statistical evidence, which provides summary information across a larger number of cases.[56,57] Thus, the defining hallmarks of quantitative evidence are its ability to express things in numerical form across multiple cases.

It is worth noting that there is no unproblematic consensus on the merits of qualitative and quantitative evidence – in the literature, the 'qualitative-quantitative debate' sometimes notes that each method is based on a particular paradigm, with the 'quantitative paradigm' based on positivism and the 'qualitative paradigm' based on interpretivism and constructivism, each with its own ontological and epistemological assumptions.[58] In brief, positivist research assumes the existence of

an objective reality that is independent from the knower, and that can be fully understood through observation and experimentation. In contrast, the interpretivist/constructivist paradigm asserts there are multiple truths and perceptions based on one's construction of reality.[58,59] This has led some to assert that quantitative methods cannot report on certain phenomena, such as patients' lived experiences, that positivism can deny the 'importance of the subjective,' and that because qualitative and quantitative research are based on different paradigms, these two methods cannot study the same phenomenon.[58,59] This thesis adopts a different paradigm – realism. A full discussion of realism's and this thesis's ontological and epistemological underpinnings is available in section 2.3, which defines how realists view reality and causation.

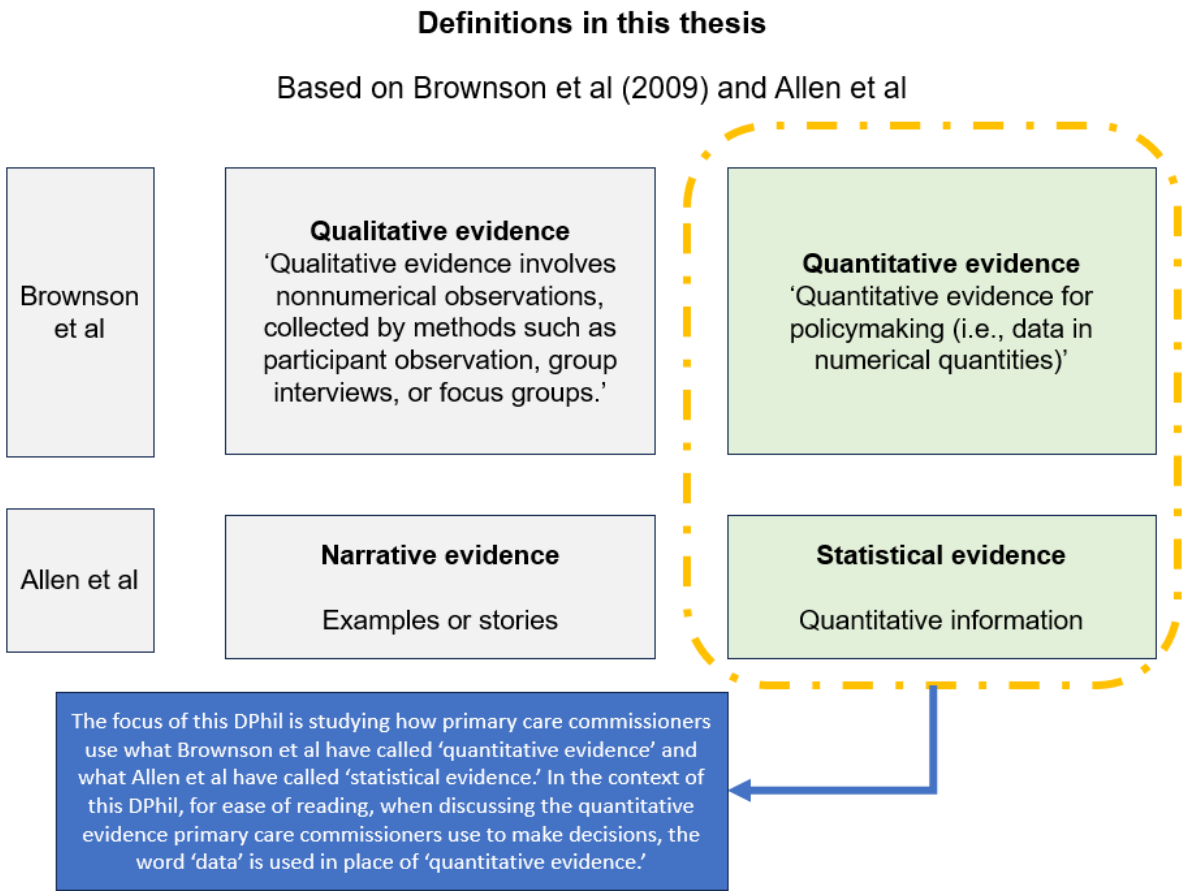
The rationale for focussing solely on quantitative data as a type of evidence is provided in section 1.8. However, following on from the summary of these paradigms and before outlining this rationale in section 1.8, it is also important to outline which reasons did *not* influence this thesis's focus sole focus on quantitative data as a type of evidence: qualitative and quantitative evidence are often compared in ways that implicitly or explicitly lend more credence to quantitative than qualitative evidence, with the former assessed as more 'objective.'[6] However, a complication of such comparisons is that quantitative evidence can capture subjective views, such as surveys on people's preferences. Such downgrading of qualitative vis-à-vis quantitative evidence also fails to consider that both the decisions about the collection and content of data can be political and therefore endogenous to decision-making,[60] leading to doubts about to what extent the full 'objective reality' can be captured by the quantitative. Even if quantitative evidence were able to capture the

full ‘objective reality,’ it is still open to different interpretations by its consumers. Therefore, this thesis’s focus on quantitative evidence was not driven by beliefs that this is value-free and can objectively capture reality. A full analysis of the merits and debates surrounding qualitative vs. quantitative evidence is beyond the scope of this thesis.

1.7.2 Usage of the terms evidence data in this thesis

In the context of this thesis, when reporting findings related to the research questions (i.e. how primary care commissioners use data to inform decisions), the term ‘data’ refers to quantitative, statistical information expressed in the form of numbers, including nominal data, which aligns with the aforementioned definitions of ‘quantitative evidence’ and which is further explained below. In the definition adopted in this thesis data are therefore a specific (sub-)type of evidence and in this definition is synonymous with the term ‘quantitative evidence.’ Data are referred to in the plural form throughout this thesis. Therefore, where the term ‘evidence’ is used in subsequent chapters it refers to any type of evidence (i.e. both qualitative and quantitative), whereas ‘data’ refers to specifically quantitative evidence. Figure 1 provides further detail on this.

Figure 1 - overview of Brownson et al's and Allen et al's definitions of quantitative evidence



The definition of data used in this thesis and shown in figure 1 (i.e. quantitative/statistical evidence) can refer to data from primary and secondary sources. Primary data is gathered by researchers (or users) first hand, and secondary data comes from secondary sources not directly compiled by the researcher.[61] Evidence-based public health decisions can be based on both primary and secondary forms/sources of data (as per the definition in figure 1): for example, it could be based on using (raw) data from information systems, or peer-reviewed

systematic reviews which contain syntheses of existing information.[6] Some data (as per the definition in figure 1) therefore consists solely of numbers or figures and has not yet been analysed or given any 'value,' whereas other data may already have been subject to some degree of analysis or interpretation. An example of the former in the context of primary care commissioning could be the raw outputs of a computer system that are only numerical properties (and is yet to be interpreted by primary care commissioners), and an example of the latter could be outputs from the NHS's 'Atlas of Variation'[62] which provides commissioners guidance on 'unwarranted variation' by showing e.g. which spending quintile a geographical area is in for particular health services and spending trend data. Whilst commissioners would still need to decide what do to after reviewing the 'Atlas of Variation,' the data in this tool have already been subject to some degree of 'sense-making' prior to commissioners viewing them. Any CMOs developed in this thesis can thus relate to primary or secondary data (data as per the definition in figure 1). The CMOs developed did not differentiate between primary care commissioners' usage of primary and secondary data.

In chapter 4, when reporting CMOs, i.e. the findings of the analysis, the term 'data' is thus synonymous with what is called 'statistical evidence' or 'quantitative evidence' as defined in figure 1. If a CMO in chapter 4 therefore refers to 'data,' this word refers to 'statistical evidence' or 'quantitative evidence' as per the definition outlined in figure 1. In addition, where this thesis specifically talks about *how primary care commissioners use data* i.e. the *user* or *analyst* of data is a primary care commissioner, what is meant is their use of 'statistical evidence' or 'quantitative evidence' (see figure 1).

As is the case with almost every doctoral thesis in the field of health services research, the findings of this thesis are based on analyses of primary and secondary sources or 'research data.' This is also the term used by realist methodologists such as Pawson and can refer to information gathered and analysed to answer the research questions. Where this thesis talks about the analysis *conducted by the author* it may refer to these sources as data. For example, if a sentence were to state 'I analysed interview data as per the suggested framework of realist methodologist X' we hope that the reader will understand that this refers to the interview content outlined in the methods section.

1.8 Rationale for the sole focus on data in this thesis

A key aim at the outset of this thesis was the production of policy recommendations for the NHS to promote and increase the usage of evidence in primary care commissioning. As previously outlined, the sparse existing literature suggested that the process of evidence use in commissioning was complex and that commissioners had access to a wide range of evidence, often used in context dependent ways. Given the relatively simple delineation of qualitative and quantitative evidence (data), choosing to focus on one of the two seemed feasible and likely to enable more in-depth analysis and thus the production of more tailored recommendations.

I chose to focus on data (i.e. quantitative evidence) over qualitative evidence since I felt this form of evidence was more frequently mentioned in the NHS's and government's policy plans and commitments, its financial benefits had been quantified to an extent that those of qualitative evidence had not, research suggests that commissioners may find data more persuasive than qualitative evidence, and

due to the government's investment in and the promotion of data. This choice is a pragmatic and not a judgemental one about the merits of one type of evidence vis-à-vis the other: in line with my aim to develop policy recommendations, I believed that by focussing on the type of evidence that appeared to receive the more investment and endorsement from the NHS I could impact policy and effect change more than focussing on either all evidence or solely qualitative evidence.

Each of these factors are explored in more detail below:

1.8.1 Mention in policy plans

A commitment to using data in commissioning to achieve cost savings and better patient care has also been cemented in several recent policy documents and plans. The 'Next Steps on the NHS Five Year Forward View' (2017) mentions reducing unwarranted variation facilitated by RightCare data, and almost all Sustainability and Transformation Plans (which aimed to implement the 2014 Five Year Forward View) mention RightCare.[63,64] A 2022 policy paper published by the Department of Health & Social Care outlined a vision of making the NHS 'more data driven,' outlining progress such as the development of the 'Fingertips service' to provide data to commissioners.[65]

1.8.2 Potential financial benefits quantified related to increasing the usage of data in commissioning

Increasing the usage of data in commissioning has the potential to provide financial benefits, some of which have been quantified. The NHS is facing severe financial and demographic pressures, including an ageing population increasingly suffering

from multi-morbidities (associated with growth in health care costs), with costs in expenditure expected to rise in the medium- to long-term even according to conservative estimates.[66,67] Some health economists have argued that in order to remain financially sustainable, the NHS must utilise data on healthcare expenditure and understand drivers of variation of activity and cost to inform decision making.[66] Providing the best-value and most effective health interventions has the potential to reduce unwarranted variation, increase efficiency, and create savings that are crucial to the long-term sustainability of health services.[52] According to a report published by the House of Commons Science and Technology Committee in 2016, the NHS was 'considerably behind' other industries in terms of using data analytics, and could save between £16 to £66 billion per year if it employed data analytics more successfully.[68]

1.8.3 Efficacy of data at persuasion

Some research, including a meta-analysis, comparing the persuasiveness of quantitative and qualitative evidence has found that people are more persuaded by messages using statistical proofs than narrative examples.[56,57,69] A further meta-analysis comparing the effects of statistical and narrative evidence on beliefs, attitude, and intention found that statistical evidence had a stronger influence on beliefs and attitude, but narrative evidence had a stronger influence on intention.[69] If the attitudes of primary care commissioners align with this research (it was not possible to find a study on the evidence preferences of primary care commissioners at the outset of this study), it follows that they may be both more persuaded by

quantitative than qualitative evidence that thus more likely to incorporate it into their decision making.

1.8.4 Investment in and promotion of datasets

Many of the evidence sources and related projects the NHS and government have invested in and produced over the past decade have been quantitative in nature. These include e.g. the NHS RightCare datasets, the 'Fingertips service,' and the Atlases of variation.[48,63,65] Whilst NHS commissioners do use qualitative information,[70] it was not possible to locate a similar number of large projects or investments in the obtainment of qualitative information. In addition, CCG guidance on the sources of evidence that commissioners could use to inform specific commissioning activities focus heavily on data, with only a few sources of qualitative evidence mentioned.[11]

1.8.5 Literature on data use in commissioning: critique of the utility of available data and commissioners' challenges using them

However, despite the NHS's commitment to using data in commissioning a key enabler of cost savings and improved health outcomes, the limited literature on this topic has criticised the utility of the data available and found that commissioners have challenges using them. A 2018 article on RightCare, which has been promoted by NHS England and produced 'Commissioning for Value' packs including benchmarking data tailored to each CCG, argued that RightCare promises 'illusory savings' based on inappropriate fixed comparator groups whose performance CCGs could not necessarily match and concluded that 'given the pressure for CCGs to adopt NHS RightCare, the lack of any peer-reviewed evaluation of its methods is

striking.'[63] A 2018 PhD thesis on prescribing for diabetes stated that prescribing variations in the NHS persisted, despite 'ongoing scrutiny' and the availability of data and government-led initiatives to reduce them.[71] Others have voiced concerns about programmes such as Getting it Right First Time (GIRFT), which aims to use data to improve care and eliminate waste, stating that there might be a 'lack of realism in the costing' and scepticism about potential savings has led to a lack of 'managerial engagement and action.'[72] A study on the Atlas of Variation in Healthcare, which highlights variation in expenditure, activity and outcomes across PCTs, found that although it could have merit in stimulating discussion and understanding variations, PCTs sometimes had difficulties using it due to, inter alia, the 'generic hurdles to using research evidence' including awareness, acceptance and the perceived applicability of the data.[48]

1.9 Research questions

I have described that the usage of evidence in both commissioning and policy-making is a complex, context-dependent process, unlikely to be easily influenced by a single intervention or repeatable, linear process applicable to all commissioning scenarios. The NHS has made a commitment to increasing the use of evidence, in particular data, in commissioning to achieve cost savings and health benefits. However, the existing limited literature on this topic has critiqued both the applicability of the data available, highlighted the barriers inhibiting their usage by commissioners, and concluded that more research on the role of contextual factors that promote and inhibit the usage of data from the perspective of commissioners themselves. A realist approach focusses on the role of context and seeks to

understand why the same intervention or programme (in this case the usage of data in commissioning) works differently in different contexts.

My DPhil aims to make a novel contribution to the literature on the usage of data in commissioning by using two realist approaches to examine the complex process of a particular form of evidence (quantitative data) by commissioners (to be elucidated on further in the results chapter). It is the first study to apply a realist approach to studying how primary care commissioners use data in their work.

My research questions are:

- How and why do commissioners use data to inform commissioning? What outcomes does this lead to?
- What factors or contexts promote and inhibit their usage of data in commissioning decisions?

1.10 Funding acknowledgements

My DPhil was funded through a School for Primary Care Research (SPCR) studentship funded by the National Institute for Health Research (NIHR), which provides funding for university and college fees as well as living costs. I was initially awarded a three-year studentship commencing in October 2018. I was awarded a subsequent 12-month studentship extension due to the amendments I had to make to my DPhil due to the COVID-19 pandemic. In October 2022, I was awarded an additional four months of funding for living costs and university/colleges fees via the NIHR's bridge- and seedcorn funding. I have also received various small grants from

the College Academic Fund and DPhil Additional Research Fund of Exeter College to cover training and transcription costs throughout my DPhil.

1.11 Structure of thesis

Following this introductory chapter, in chapter 2 I describe my methodology and explain the philosophical underpinnings of realism, explaining why this is a suitable approach for my DPhil topic. I define the key terms within the realist school of thought I use and outline the guidelines and standards that informed my DPhil. I also outline the ethical approval requirements for my primary data collection.

Chapter 3 describes the methods I used for my secondary and primary data collection and analysis. I outline how I completed a realist review (a type of systematic review) and collected primary data from the analysis of commissioning meeting minutes and recordings, as well as interviews with commissioners and experts on commissioning. The primary data gathering and analysis phases of my DPhil occurred in parallel using a constant comparison approach, which I outline and justify. I also present my 'programme theory' which contains initial hypotheses about how commissioners use data to inform commissioning. I also outline how I adapted my research to the COVID-19 pandemic.

In chapter 4, I present the findings from my secondary and primary data collection. I compare and contrast the findings across the different sources, attempting to explain discrepancies. I present my revised programme theory, and link this back to the original programme theory developed in chapter 2.

In chapter 5, I discuss my findings, show how I have made a novel contribution to the literature, consider how my personal background may have impacted my findings (reflexivity), and discuss the strengths and limitations of my research. I conclude by making recommendations for policy as well as reflecting on future directions for research.

2. Methodology

> ‘Evaluators need to penetrate beneath the surface of observable inputs and outputs of a programme…That which we can observe, including the most manifest and routine regularities, is produced by the operation of underlying generative forces which may not be immediately observable. Interventions are always embedded in a range of attitudinal, individual, institutional, and societal processes…’[73]

In this chapter, I describe the aims of realism, outline the key tenets of scientific realism, and argue that realism is a suitable methodology for my research topic, which is a complex and context dependent programme. I define key terms within the realist school of thought that I am using, particularly contexts, mechanisms, and outcomes, and explain the concept of a Context-Mechanism-Outcome (CMO) configuration. I provide an overview of the ontological and epistemological foundations of realism and define the concept of generative causation. I provide an overview of the realist guidelines and standards that informed my DPhil, as well as outlining how programme theory is developed and refined in realist research. I provide an overview of the potential transferability of my research, and outline the key forms of thinking and reasoning (induction, deduction, retroduction, and abduction) that guided my analysis. I also list the steps I took to obtain and adhere to the required ethics approval.

2.1 Aims of realism

The primary aim of realism is understanding what works for whom in a set of given circumstances.[73] Realism has an explanatory rather than judgemental focus, meaning it aims to understand and unpack the mechanisms that influence how interventions work (or fail to work) rather than provide a definitive judgement on what works or effect size within a specific confidence interval.[74-76] It achieves this by seeking to unpack the relationships between contexts, mechanisms and outcomes to help understand failures, successes, and other outcomes of programmes and interventions.[76]

Realism is well suited for the study of complex health policy and interventions, because it makes the assumption that people have the agency to effect change through their actions, and because health policy is considered to be a complex system with people at its core, whose ideas, relations, and actions can trigger change.[77] There are several different checklists and definitions to define the term 'complex intervention' or 'complexity.' Medical Research Council guidance, which has undergone several updates, stresses that complexity resides in, inter alia, a programme's interacting components, the number and variability of outcomes, and the degree and flexibility of tailoring the intervention.[78,79] Pawson (a key realist methodologist) has listed both seven defining features of complex service interventions[74] as well as a 'complexity checklist.'[80] The usage of evidence in commissioning aligns with many of the key points of both definitions, including that they achieve their effects via the active input of individuals, that they are embedded in multiple social systems and are unlikely to be equally effective in all

circumstances, that the choices (or volitions) people make impact outcomes, and that different people may make different choices.[74,80]

2.2 Scientific realism

Whilst there are different schools and traditions within realism, I am using the approach of scientific realism as set out by Pawson and Tilley. In developing scientific realism, Pawson and Tilley drew on the realist tradition in the philosophy of science, identified in the writings of Hesse, Harré, Sayer, Bhaskar, Boudon, and Stinchcombe.[73,81] Certain aspects of scientific realism have similarities to and draw on other areas of philosophy: for example, Pawson and Tilley note that their concept of generalisation has some overlap with the ideas of Znaniecki (1934), Mitchell (1983), and Sayer (1984)[73], and the concept of retroduction (using inference to theorise and test hidden mechanisms) is also used in the natural sciences.[82] Their realist philosophy of science draws on Popper and Campbell in its philosophy of science and the usage of application of judgement and abductive reasoning.[83] Pawson and Tilley drew on the works of Roy Bhaskar, who is aligned with the school of critical realism, and argued that some aspects of Bhaskar's work were consonant with their philosophy, primarily regarding the differences between physical and social systems and sciences.[80,84] However, Pawson has also critiqued some aspects of Bhaskar's work, especially Bhaskar's position on the emancipatory purpose of research, characterising this as a normative approach espousing an a priori view on how the world ought to be and then criticising those who depart from it as deceitful and duplicitous.[85,86] However, some of Pawson's critiques of Bhaskar have in turn been criticised, in particular by Porter, who has stated that the difference between

realist evaluation and critical realism are not as vast as Pawson has asserted and that Pawson has misread elements of Bhaskar's work.[84]

2.3 Ontology and epistemology of realism

In this section, I will illustrate the relationship of realism to two other world views, namely what I have called positivism and constructivism. In using these terms, I accept that there are different understandings of what they mean, and also have at times be used in pejorative way. I have used two definitions of these terms drawn from the literature and do not claim that these are exhaustive definitions.

Positivist ontology asserts there is an objective reality existing independently of human interpretation, meaning the observer and the observed are independent of each other.[87] 'Facts' can be discovered via observation, and only what can be observed is a valid source of knowledge.[87] Positivism is therefore based on an ontology stating that the things we experience are what exists, and its epistemology requires the researcher to verify this experience through deductivism.[88]

Conversely, constructivism states that knowledge is socially and individually constructed and interpreted, and that we can never fully know what reality is and what exists.[87] Constructivism is an epistemology lacking a clear ontology: its focus is on understanding the meanings and actions of people, and the aim of the constructivist researcher is to investigate 'individual worlds' and the meanings and interpretations people give them.[87,88] Realism sits between the two, and has several key philosophical assumptions.[87] Realism is not simply a method or toolkit for conducting research – it has its own epistemology and ontology with several defining features.[89]

Firstly, realists have a unique understanding of causation referred to as generative causation. To better explain generative causation, I will first outline a common opposing understanding, namely successionist causation. Successionists state that we cannot directly observe causes but rather sequences of events, and that the regularity of the joint occurrence of events gives us warrant to inductively infer a causal connection.[89] Successionists follow Hume's view that causation is unobservable and that one can only make such inferences on the basis of observational data, meaning we should aim to control a sequence of observations to differentiate causation from association.[73] This can be achieved through 'gold standard' Randomised Controlled Trials (RCTs) which follow an experimental logic that seeks to create a situation in which the sole difference between the control and 'treatment' group is the intervention, with the intervention being viewed as responsible for the resulting changes.[80,90]

In the social sciences, successionist generation is sometimes identified using a regression model, which analyses the cause of an outcome by attempting to explain statistical variance by fitting the independent variables to the model to give the best 'fit.'[91] However, statistically significant relationships do not speak for themselves and are also open to interpretation. For example, if age is found to be a significant predictor of something, it may not be the physical age of a young person's body that impacts outcomes, but rather e.g. the experiences that age bestows or preconceptions that lead people to act a certain way.[83] This type of causal analysis divorces theoretical reasoning from the empirical, and the translation depends on operationalising theory (the variables do not speak for themselves – they are constructs) and researchers must still make inferences about how variables are

associated.[91] Successionist causation is commonly used by positivists, who derive explanations from observing correlations and reducing interventions to their component parts, leading some to criticise that positivists explain interventions as only the sum of their observable parts.[92]

In contrast, realists believe in the generative model of causality, wherein hidden, or not directly observable mechanisms are believed to generate outcomes.[93,94] Interventions can be successful due to changes in the reasoning and minds of participants, including changes to self-esteem, perceived shame, new skills, etc. Such 'hidden' mechanisms are difficult to capture in an RCT or experimental design but are essential for understanding why a similar intervention may fail in some circumstances but succeed in others. In addition, realists believe in a mind-independent reality, i.e. the idea that the world exists independently of our knowledge of it, and a person's perception of reality is always fallible and partial.[93] All enquiries and observations are shaped and filtered by human brains, and therefore there can be no 'final' truth or knowledge.[87] In summary, realist ontology states that (some) of the structures creating the world cannot be directly observed, and its epistemology states that what can be seen or observed is not necessarily sufficient to understand the mechanisms accounting for these appearances.[88]

Several further key terms and assumptions of realism are outlined in the following sections.

2.4 Middle-range theory and programme theory

2.4.1 Middle-range theory

Realists draw on Merton's definition of middle-range theory, i.e. a theory that involves abstraction, but is still detailed enough to be developed into testable propositions that can be compared to data.[73,95] Middle-range is not a specific category or type of theory, but an adjective used to describe the level of abstraction in a theory.[96]

2.4.2 Programme theory

A programme theory is an idea or set of assumptions about what makes an intervention work, and explains how and why an intervention might work in different contexts.[77,80] Where possible, realist programme theories should be middle-range[97] and can be based on existing substantive (also known as formal) theories or models that describe a specific phenomenon e.g. Bandura's Social Learning Theory, Merton's Reference Group Theory, and the Capabilities model, thereby allowing the researcher to access a wealth of existing knowledge and research about a topic, and accessing more abstract analytic frameworks can accelerate programme theory development.[73,96,98] Realists use substantive theories to help identify mechanisms and contexts, and explain how findings fit together.[96]

An initial step in developing programme theories and linking them to substantive theories is the process of 'moving up and down the ladder of abstraction,' requiring the researcher to consider what programme theories are examples of, and how programme theories relate to formal (or substantive) theories and analytical

frameworks.[73,99,100] The ‘ladder of abstraction’ enables researchers to move from specific, individual examples to CMOs to more abstract explanations (including substantive theory) and back.[101] Substantive theories can help bridge between different cases and provide access to a wealth of research and knowledge about a topic.[77]

Section 3.2.1. describes the initial programme theory development and how substantive theories were selected.

2.5 Contexts, mechanisms, and outcomes

2.5.1 Contexts

The realist definition of context is not limited to setting, and can refer to any characteristic of the individuals partaking in a programme, the interrelationships between stakeholders, and institutions in which the programme is embedded and the wider societal, economic and cultural setting of a programme.[102] Context is therefore not limited to spatial or physical locations but also norms, values and interrelationships, and programmes can include multiple contexts.[73] People respond to programmes differently and have different forms of reasoning, which can be influenced by e.g. gender, religious beliefs, individual capacities, etc. The same programme may fail in one physical location (e.g. a specific school or hospital) but succeed in another – realism seeks to understand what it is about what is functioning as contexts in that particular setting that impacts whether the programme worked.[103] Although context can therefore refer to many things, researchers should focus on hypothesising and testing contexts that are relevant to the outcomes which they are interested in rather than listing all the contexts they can identify.[102,103] In other words,

it is more useful to think about things functioning as context for specific outcomes within a CMO configuration (see below for more details about CMO configurations).

2.5.2 Mechanisms

The operation of a mechanism in realism is always contingent on context.[73] Pawson and Tilley's conception of a mechanism has evolved over time and is still being refined and debated within the realist literature.[94] The original formulation focussed on the ability of programme outputs to follow from stakeholders' choices and behaviours.[94,104] In 2004, they enhanced their definition by stating that a mechanism is usually hidden, sensitive to variations in context, and produces effects and in 2006 Pawson added that choices are 'choices under the inducement of programme resources' and that programmes only had impacts through the ' reasoning and reactions of their recipients.'[104-107]

Mechanisms are agents of change that will only activate in certain conditions or contexts.[80,81] In 2017, the RAMESES (Realist And Meta-narrative Evidence Syntheses: Evolving Standards) project stated that mechanisms were hidden (but connected to context), provide an account of how and why programmes lead to outcomes, and follow from the interaction between a programme's resources and how people choose to respond (or not) to them.[94] Contrary to the empiricist notion that what is seen is what is 'real' and things that cannot be seen are not, realists believe that mechanisms are real in the sense that they are key to understanding how the world is organised and have dispositional powers which can lead to resulting events which can be observed empirically.[80,108] Mechanisms are dormant until they are activated by certain contexts, but this activation has been compared by realist

methodologists to a ‘dimmer switch’ whereby the intensity varies in line with a changing context rather than a binary on/off switch.[81]

2.5.3 Outcomes

Outcomes include the intended and unintended consequences of programmes, resulting from the activation of different mechanisms in different contexts.[109] Contexts, mechanisms and outcomes are joined to form CMO configurations, which are the building blocks of realist causal explanations, and the task of realist researchers is to identify, articulate, test and refine these CMOs.[73,77] CMOs are semi-predictable reoccurring patterns, tendencies, or demi-regularities, but they are not enduring generalisations[105,110], i.e. we cannot always definitively trigger a certain outcome by manipulating context.

2.6 Guidelines and standards

I followed the realist publication standards for realist syntheses (RAMESES I) and reporting standards for realist evaluations (RAMESES II), which outline items that should be included in realist publications. The RAMESES I and II projects aimed to produce quality and publication standards and training materials for realist research approaches.[111]

2.7 Transferability of results

The aim of realist research is to generate the ‘descriptive particulars' of an individual programme. Realists believe that what is transferable between cases are not lumps of data but sets of ideas.[73] Cumulation should occur via improvements in theory, and is not a matter of achieving results with universal applicability: theory is the

bridgehead between the goals of generalisation and specification.[73] All realist conclusions are contextual, and realist research cannot produce generalisable claims and universal regularities, but can provide transferrable ideas about how programmes are shaped by certain contexts[74,93] allowing for the future manipulation of contexts to trigger certain mechanisms.

Realist research can facilitate transferring knowledge by creating a realist theory of an intervention,[112] and learnings from realist analyses can be transferable due to the transferability of common mechanisms across different settings, such as the mechanism of perceived convenience making people more likely to engage with healthcare services.[113] Realist analyses can result in findings that are theoretically transferable, allowing for the testing of ideas or theories in different contexts with different stakeholders.[75] It is possible that an assumption about a mechanism working in different settings will turn out to be incorrect, in which case it may be required to refine or refute assumptions about mechanisms in certain contexts.[113]

2.8 Induction, deduction, retroduction, and abduction

I applied several forms of reasoning during the realist synthesis and evaluation:

2.8.1 Induction and deduction

Induction allows for the creation of theory from data and derives conclusions from observations, whereas deduction involves the testing of theory against data.[82,114] However, purely inductive and deductive inference is not sufficient to support the discovery of ‘hidden’ generative mechanisms and correlates to a ‘flat ontology,’ whereby only things that can be empirically seen and observed are analysed.[82]

2.8.2 Retroduction

Retroduction is a form of inference that aims to identify the hidden causal forces that lie behind patterns or regularities to discover what produces them.[114,115] Retroduction is related to Bhaskar's concept of ontological depth, i.e. that reality is stratified in the nested layers of the empirical (observable and perceptible), the actual (which includes the empirical realm and consists of things that exist even if they are not material and cannot be experienced) and the real (which includes the empirical and actual realms as well as latent and activated mechanisms) – retroduction can help reveal and explain why outcomes occur at an empirical level.[82,89]

2.8.3 Abduction

Abductive reasoning refers to 'inference to the best explanation' and involves a process of examining evidence and developing hunches or ideas about the causal factors linked to that evidence: it is the inventive thinking required to imagine the existence of the mechanisms tested via retroduction.[82,110] The process of abduction allows empirical data and ideas to be re-described using theoretical concepts or frameworks, but unlike inductive reasoning, which moves directly from observations to theory, abductive reasoning is often applied to incomplete data and relies on theories as mediators – for example, if a researcher observes outcome X, and can reason that Y is a prerequisite for X, there is reason to expect Y to be true, i.e. inference to the most plausible explanation.[116-118] One limit of both abductive and retroductive thinking is that neither have any fixed criteria that allow a definitive assessment of their validity, and both require a degree of subjective imagination.[119]

In the subsequent methods chapter, I will explain how these principles were used to apply a realist logic of analysis in practice.

2.9 Ethical approvals

I received ethical approval via the university's Central University Research Ethics Committee (CUREC) 1 process for lower-risk research involving human participants and/or their data (project R68193 RE001). The Medical Sciences Division's Ethics team confirmed (after consultation with Clinical Trials and Research Governance) that Health Research Authority (HRA) approval was not required for this study, as recruitment was conducted through CCGs rather than the NHS. I therefore sought ethical approval only from the Medical Sciences Interdivisional Research Ethics Committee (MS IDREC). The original draft of the ethics documents (based on the assumption that meeting observations and interviews could take place in person) were submitted in early February 2020 and received approval. Following the beginning of the COVID-19 pandemic and the resultant lockdowns, various amendments and revisions were submitted and approved until mid-2022. Further detail on the logistics of interviewing, including data storage and the consent process, is covered in the next chapter. Key ethics documents (Participant Information Sheets and the Consent Form) are available in appendix 2.1.

3. Methods

This chapter provides an overview of the methods I used for secondary and primary data collection and analysis. I began my DPhil with a realist synthesis (Phase 1), i.e. a form of theory-driven systematic review, enabling me to construct initial CMO configurations. The primary data gathering and analysis phases of my DPhil (Phases 2a, 2b and 2c – detailed below) occurred in parallel. I outline how I consolidated and compared the findings and CMOs from my primary and secondary evidence sources using an iterative convergent approach, ultimately displaying the findings in a matrix. I then describe how the final and refined programme theory was developed. Finally, I report the changes I had to make to my research due to the COVID-19 pandemic.

3.1 Overview of methods

Phase 1: realist synthesis

Phase 2a: analysis of meeting recordings and minutes

Phase 2b: interviews with commissioners

Phase 2c: interviews with experts

Phase 3: consolidation and comparison of findings

3.2 Phase 1: realist synthesis

A realist synthesis is a theory-driven approach to assessing interventions, programmes, services, and policies, seeking to understand 'what works, for whom, under what circumstances, and how?' rather than simply asking if an intervention 'works.'[93] I followed Pawson's suggested iterative steps for a realist synthesis, as well as the steps outlined by Papoutsi et al.[109,120,121] The sections below outline the steps I took to locate and analyse content and the reasoning behind these. A protocol for the systematic review was registered on PROSPERO: International Prospective Register of Systematic Reviews with the project ID CRD42019137766.

3.2.1 Step 1: Locate existing theories

A realist synthesis should begin with an exploratory scoping of the literature to develop an initial 'rough' programme theory about how the programme is supposed to work.[105] The purpose of this initial programme theory is to act as a guide for refining initial hunches and hypotheses against the data from the full literature search (step 2).[121,122] Ideally, a realist analysis should identify a number of theories from studies and subsequently find additional studies that test the same theories.[121,122]

Pawson and Tilley emphasise the importance of constructing initial programme theories, but note that a realist analysis may have to start with a general (i.e. not realist because it does not contain CMO configurations) theory,[123] especially where the primary studies available do not identify and test theories, meaning initial theory may be built through descriptive data and the identification of purported barriers and

facilitators to a programme.[122] The realist researcher's goal is to collect data that further develops, refines, and tests the programme theory, with the aim of developing a more refined programme theory at the end of the synthesis and/or evaluation.[124]

Initial programme theory can be elicited through a range of sources including the assumptions of programme designers and implementers using interviews, exploratory on-site research, 'grand theories' (or substantive theories) from the broader literature, programme or policy documents as well as exploratory research and literature reviews.[77,125] There is no prescribed sequence or components to creating an initial programme theory, and some methodologists recommend combining different types of sources.[77,125]

I developed the initial programme theory through exploratory searching of the literature, a policy document, and discussions with programme implementers. The scoping search of the literature consisted of a keyword search ('Commissioning' AND 'Data' AND 'NHS' AND 'primary care') carried out in February 2020 in MEDLINE/PubMed and Google Scholar, as well as a Google search to cover grey literature. I identified 15 articles (including grey literature) that contained information on how commissioners used data to inform the commissioning of primary care services. None of these articles explicitly articulated a specific substantive theory on how using data to inform commissioning was achieved, but they did allow me to formulate hypotheses about the contexts, barriers and facilitators related to the usage of data in commissioning.

Furthermore, I identified one policy document, containing an overview of the types of data that could be used to inform commissioning, compiled by a Knowledge Officer

for a CCG[11] as well as the NHS's own official 'commissioning cycle' outlining nine steps related to commissioning.[126] However, as previously noted, these documents did not contain a link to a specific substantive theory. I was not able to elicit any (realist) theories or barriers and facilitators to using data from the policy document, but it did provide some detailed examples of the types of data that can be used in each step of the commissioning cycle. In addition, I completed three informal discussions, one with a former and one with a current NHS commissioner (programme implementers) as well as one with someone who worked in public health in the NHS, whereby I asked them to describe how they believed evidence use in commissioning worked in practice.

3.2.1.1 Initial programme theory

Drawing on an approach used by Greenhalgh et al in a study where it was not possible to build an initial programme theory in a realist format,[122] I built tentative theory from descriptive data by identifying barriers and facilitators to using data to inform commissioning in the aforementioned 15 articles and informal discussions (table 1). In addition, I was able to identify some contexts that appeared to be linked to using data to inform commissioning. This is summarised by theme below, along with the resulting potential (but incomplete and emerging) CMO configurations. These configurations were subsequently further developed and refined into full realist CMO configurations in the realist synthesis and finally developed into a full programme theory

Table 1: initial programme theory with potential incomplete CMO configurations

Theme	Summary of key points in literature/information from informal discussions	Potential incomplete CMO configurations
Financial considerations	• Financial constraints can temper the direct influence of research evidence on decision making[127] • Not being able to see the financial implications of data is a barrier to using data[48,128] • If commissioners must deliver a balanced financial plan sometimes commissioning decisions based on little or no evidence are funded[41,127] • A core role of a commissioner is to ensure you don't overspend, constant pressure to make financial savings (informal	• If commissioners feel pressure to make financial savings, they may make commissioning decisions not necessarily based on evidence to achieve this • If commissioners cannot see the financial implications linked to data, they may be less included to use them

	discussions)	
Political model of data usage	• This is a political model of data usage: research is ammunition for the side that finds its conclusions supportive, and is used to 'neutralise opponents'[129] • Sometimes purposely sought information since they were told to take a particular course of action, e.g. national directives[10,41] • 'Cherry picking' of data does happen – sometimes the idea comes first, and then data is sought to substantiate this (informal discussions)	• Commissioners may choose data selectively to support what they want to do
Collaborations	• A primary care commissioner critiqued having been 'given'	• The relationship and communication between

with external providers of data (analysis)	rather than 'chosen' a software tool to help identify individuals at higher risk of using healthcare resources e.g. hospital beds by its developers, and that they had difficulty interpreting and contextualising its outputs[130] • Collaborations with external providers can work well or not depending on several factors including the relationships between commissioners and external providers and trust[131] • Commissioners are not always happy with the data their receive from external providers, and sometimes feel they don't receive the information they need[132]	commissioners and external providers of data (analysis) is decisive in determining whether the data will be used
Knowledge of clinical vs. non-clinical commissioners	• GPs may have different knowledge of data and information and patients than other commissioners and may challenge data based on their clinical knowledge[131,133]	• If GP commissioners believe there is a contradiction between data and their experience, they may challenge them and be less inclined to use them

Triangulation and combining of data sources	• Triangulation of different benchmarking data was found to be helpful in identifying areas for action[48,134] • Commissioners want to have access to combined datasets, especially at the patient level[135]	• Combining and triangulating data sources may facilitate the usage of data
Presentation of data, data overload	• Commissioners have extensive access to evidence including national and regional directives, meeting papers, business cases, reports, patient satisfaction surveys, guidelines, pathways, and performance, activity, financial and referral data. To capture commissioners' attention, these documents often had a summary of no more than one side of A4 with clearly bulleted action points[48,131]	• The format in which data are presented may facilitate or hinder their usage
Local vs. national data	• Local data often trumped national or research-based information and local evaluations were seen as helpful in directly answering	• Local data may trump national data in certain contexts

	commissioners' questions[41,131] • Commissioners consider local data to be an important source of evidence[50], sometimes this was because a local population has distinctive features[136]	
Data vs. information	• Commissioners sometimes have challenges operationalising data[41,48]	• If commissioners cannot operationalise data, they cannot use them
Variation data	• Can be used in myriad ways to drive improvement, including by stimulating competition and peer-pressure[131,132,137] but may also lead commissioners to offer support to practices and/clinicians[132,134,136]	• Commissioners may use variation data in different ways depending on context
Data quality	• Some commissioners felt the data they had access to was of poor quality or untimely and that access to real-time and more timely data would be beneficial[10,48,128,131,138,139]	• Poor quality and untimely data are unlikely to be used by commissioners

3.2.2 Step 2: Search for evidence

I completed a formal literature search that was broad and interdisciplinary to capture a wide range of possible studies. A realist search does not need to include a comprehensive, exhaustive search for all relevant literature, but should seek to sample the literature and attain modest forms of theoretical saturation, which can be achieved as soon as sufficient evidence has been found to make claims that are coherent and plausible.[140] A realist synthesis can include additional searches as required in accordance with emergent information needs.[140] A full overview of the databases searched, search strings, and dates searched for each of the three searches outlined below are available in appendix 3.1. The results of the searches are detailed in chapter 4.

3.2.2.1 Initial database search – March 2019

A Bodleian librarian and information specialist provided support and input throughout step 2. After explaining my research topic and questions, we identified four topic areas (data, commissioning, NHS, and primary care) for the search string. To identify comprehensive search terms for the topic area of commissioning, three published review articles utilising database searches for commissioning were analysed to extract potential search terms and synonyms for commissioning.[141-143] These search terms included the individual steps of the commissioning cycle (e.g. 'needs assessment' as an individual search term) to maximise sensitivity. Due to changes in NHS commissioning over the past decades, previous NHS commissioning schemes and innovations (e.g. 'GP fundholding' or 'primary care trusts') were included as search terms.

To test the specificity of the search strings, three high quality papers (i.e. papers that met the full text inclusion criteria and provided rich insights) on the usage of data in commissioning were identified. To balance specificity and sensitivity, two versions of the search string were run on Scopus, MEDLINE, and Web of Science: one was less specific with three topic areas (data, commissioning, and NHS), and the second was more specific with four topic areas (data, commissioning, NHS, and primary care). One of the three high quality papers was only captured through the less specific search with three topic areas (i.e. without primary care), but this increased the number of retrieved papers in three databases to 5,000+. Therefore, in line with the information specialist's suggestion, in order to make the amount of papers retrieved more manageable, the database search with four topic areas was completed, as it may have been possible to capture the one 'missing' high quality paper via other means e.g. reference linking, which was eventually the case during the full text review. The information specialist reviewed the search strings for every database and provided guidance on how the search strings should be tailored to specific databases.

3.2.2.2 Additional search – October 2019

This additional search in October 2019 focussed on modifying the search string to incorporate the phrase 'evidence based commissioning.' During the initial database search, I identified several useful and theory-rich studies containing this phrase in the abstract. The main search included 'data' as one of the four topic areas, i.e. a specific type of evidence rather than evidence as a more general concept or term. I hypothesised that there may be further papers that mentioned 'evidence based

commissioning' but not 'data,' as this is a specific type of evidence, and that such papers may have been missed during the initial database search. I therefore began by running a search for the terms 'evidence based commissioning AND primary care AND NHS' on all the databases the initial database search (March 2019) had been run on (except for HMIC). Since this only returned a very small number of studies, I ran a further search only for the phrase 'evidence based commissioning' in six databases.

3.2.2.3 Updated search – March 2022

In March 2022, I carried out an updated database search to identify papers that had been published between March 2019 and 2022.

3.2.2.4 Other means of identifying studies

Throughout my DPhil, I identified studies using reference linking.

3.2.3 Step 3: Select studies

The selection of studies (the term 'studies' in the context of the realist synthesis refers to the documents included in the synthesis, including grey literature, and is used interchangeably with the word article in this thesis) focussed on the ability of articles to contribute and refine the programme theory. Following the database search, I imported the articles into Rayyan, a systematic review software that enables the screening and organising of articles. During the initial screening stage, if an article's title and abstract met the following criteria, I selected it for full-text review:

- The article is written in English.

- The article describes how data has been used, either alone or in conjunction with other forms of evidence, to make, inform, or influence decisions about commissioning primary care services within the NHS in England. The article must describe how this has actually happened (as opposed to articles describing how data *could* or *should* be used).

Many of the studies found were about commissioning as a whole rather than the commissioning of a specific type of service e.g. secondary or primary care – therefore, in addition to studies focusing solely on the commissioning of primary care services, studies about commissioning pathways or services that were in part located in primary care were included, in line with the definition of commissioning of primary care services provided at the beginning of this thesis. In addition, some studies focussed on commissioning at an organisational level, e.g. on a specific CCG or PCT. Provided the organisation was one that commissioned, inter alia, primary care, the study was included. No date restriction was applied to the database searches, however since the provider-purchaser split in the NHS occurred in 1991, there were no articles predating this. Articles did not need to be peer-reviewed to be included so that more relevant information could be captured.

I shared a random 10% of the articles with a second reviewer (MA – a DPhil student with a clinical background who also used realist approaches in their DPhil) to ensure the inclusion criteria were being applied consistently during the initial screening stage. MA and I initially screened the random 10% sample independently of each other and applied the inclusion criteria, and subsequently compared our results. We discussed any disagreements and ambiguities and refined the criteria as well as our

approach to screening as a result to achieve more consistency. The main disputes pertained to ambiguities around articles that were hypothetical, i.e., articles that described how the authors thought data could or should be used in commissioning - we were able to agree that in line with the research questions, I should be strict about including only articles that described the actual usage of data to inform commissioning, which was subsequently emphasised in the inclusion criteria. In addition, the second reviewer did not have specialist knowledge of commissioning and was therefore occasionally unsure if a specific article was describing a commissioning activity. We discussed each of these ambiguous papers in turn, and I made the final call about whether or not I thought a paper described a commissioning activity by drawing on my knowledge of the literature.

Following the title and abstract screening, I screened the full text of the articles that met the inclusion criteria. I used three criteria to determine if an article should be included: relevance, rigour, and trustworthiness. According to Pawson, data are relevant if they add to the review and are relevant to programme theory development, i.e. if they help corroborate, refute or refine aspects of programme theory.[105,144] The assessment of rigour (as defined by Pawson) is conducted by analysing whether the methods used to generate data are credible and trustworthy.[144] Such an appraisal requires the researcher to apply a degree of judgement in contrast to traditional 'Cochrane' reviews that can use a predefined appraisal checklist.[106] Realist researchers can also use the criterion of trustworthiness to assess the quality of data in the included articles by applying the following considerations: (i) check if the articles outline the methods for data collection, and are thereby unlikely to be fabricated, (ii) treat articles with scepticism

if the methods for obtaining data are not stated, (iii) attempt to find more than one source of data to support each aspect of programme theory.[144]

No restriction to the type of study was applied: when conducting a realist synthesis, researchers should consider a range of empirical evidence and assess its value in terms of contribution to programme theory development rather than a 'methodological hierarchy of evidence' meaning a certain study or document should not be privileged due to the document's methodology or classification.[144,145] Once more, a random 10% of the articles were given to MA for full-text screening as per the inclusion criteria to ensure consistency. We discussed inconsistencies and disagreements between our screening decisions and resolved these through discussion and refinement of the screening criteria.

3.2.3.1 Overview of included studies

An overview of the included studies and the methods used to identify them is displayed in the PRISMA diagram in chapter 4.

3.2.4 Step 4: Extract and organise data

Once I had completed the full-text screening, I imported the included articles into NVivo 12 (a qualitative data management computer software package) for coding. I captured the key characteristics of the 92 included studies (e.g. name, year, authors, etc.) in an Excel spreadsheet, presented in chapter 4.

3.2.5 Step 5: Synthesise the evidence according to a realist logic of analysis

3.2.5.1 Forms of reasoning used for CMO formation

In addition to the four forms of reasoning described in section 2.8. (induction, deduction, retroduction and abduction), I used several forms of reasoning during the analysis process suggested by Pawson, namely juxtaposition, reconciliation, consolidation, and situating:[105]

Realists use *juxtaposition* to place two or more things or evidence fragments together and suggest a link between them – for example, one study can provide data to make sense of an outcome noted in another study.[105,146]

I also used the process of *reconciliation*, whereby differences in contexts can be found to explain apparently contradictory findings.[105,146] Pawson suggests that where there appear to be differing results in comparable circumstances, these should be examined further to find possible reasons for the different results.[105,147] This can lead to refinement and development of further CMOs. For example, during the initial reading of some texts I could see that variation data (having access to variation data was initially hypothesised to be a single context) appeared to be used very differently and led to different outcomes.

Realists also use the processes of *situating* and *consolidating* when making CMOs: for example, if there are two successful outcomes that are the result of different mechanisms and contexts, consolidation allows the researcher to consolidate the results into a multi-faceted explanation of success (usually linked to a larger and

more complex CMO), in contrast to the more granular situation of rival theories ('this mechanism in context A, that one in context B').[105,146]

For some CMOs, the component parts were either clearly stated in the literature or could be found via inductive or deductive reasoning alone, whereas for others retroduction and abduction had to be applied to identify parts of CMOs, especially mechanisms. 'Intangible' contexts were sometimes derived from descriptions or feelings about tangible matters: contexts can refer to both tangible objects such as infrastructure or people, but also intangible concepts such as relationships between stakeholders or the wider cultural setting of a programme.[102] Some of the contexts identified were intangible related to e.g. commissioners' perceptions, but these were based of descriptions of tangible facts. For example, commissioners described the NHS as 'cash strapped' and described the need to make a budget balance – whilst the NHS's balance sheet and the statutory duty to remain within a budget are 'real,' a commissioner's perception that they are facing financial pressure is intangible but derives from these tangible things.

3.2.5.2 The analytical process of CMO development and refinement

The following steps and processes outlined draw on Pawson's guidance on CMO development and refinement, as well as a methodological paper outlining CMO development.[73,146,148]

During the first read of the included articles, I coded all the concepts and ideas that seemed relevant in one NVivo file. These codes did not necessarily follow a realist logic of analysis, i.e. they were not necessarily coded as contexts, mechanisms or outcomes. I began by coding outcomes: outcomes can be proximal or final.[110] In line

with other realist research exploring evidence use,[149-151] I considered not only the actual usage (or not) of data, but also the intention or commitment to use (or not) data as an outcome when constructing CMO configurations. The proximal impacts (or outcomes) of an intervention can make achieving (final) outcomes more or less likely - when studying evidence or research use, a proximal outcome might include an intention to use ideas, techniques, or resources, perceptions about the value of research, and knowledge and skills.[150,151] In the context of this research, a commitment or promise to using data in a commissioning decision could be a proximal outcome to the final outcome of actually using data.

After reading all the articles several times, I began re-labelling the words and themes that I had coded as contexts, mechanisms, or outcomes, although there were initially very few mechanisms. This was the first time the 'ladder of abstraction' was used, i.e. the move from individual examples to more abstract concepts. A realist logic of analysis requires the researcher to move from data to theory repeatedly, and attempt to frame explanations at a middle-range level, i.e. a level of abstraction that permits empirical testing.[121] I initially attempted to link contexts to outcomes in the forms of propositions that were at a similar level of abstraction to those in the initial programme theory, e.g.:

- Commissioners may choose data selectively to support what they want to do.
- Local data may trump national data in certain contexts.

This was facilitated by juxtaposition, used to link such propositions i.e. individual contexts and outcomes across multiple articles. Throughout the process of developing these initial context-outcome propositions, certain similar propositions

were merged. In some cases, it was not possible to usefully ‘abstract up’ an individual context or outcome (i.e. they remained at the level of a specific example), or link them in a meaningful way, leading to their disbarment. At this point, demi-regularities, i.e. recurring, semi-predicable patterns, began to emerge across the articles, with each draft proposition (in some cases after articulation at a more abstract level) underpinned by multiple fragments of text.

Following this, I began to link these propositions to mechanisms, and, where possible, substantive theories (see section 3.2.5.3) to develop full CMOs. Initially, mechanisms were identified and developed via the identification of existing mechanisms in the articles or substantive theory, inductive and deductive reasoning where possible, and, failing this, more abstract forms of reasoning were employed, namely retroduction and abduction. Sometimes it was possible to identify a clear, single mechanism at play in a CMO, especially where a substantive theory could be used to facilitate CMO development. In other cases, this was slightly more ‘messy’ and challenging process, especially where abductive and retroductive reasoning had to be used. As a result, some CMOs contained multiple mechanisms, either because the substantive theory used to develop them contained multiple mechanisms, or because there were multiple equally plausible and supported mechanisms. In such cases, I considered whether it would be possible to merge mechanisms or group them by making them more abstract, and subsequently tested the CMO against the content from the articles, but several CMOs remained with multiple mechanisms.

The result of this was an initial list of draft CMOs which were grouped into several larger themes related to contextual similarities including financial circumstances,

skills, and data quality. The next step was to look for negative or contradictory examples, both between the CMOs and by revisiting the original articles to look for disconfirming examples i.e. anything that appeared to be in conflict with my draft CMOs. I subsequently revised my CMOs, typically through the creation of new CMOs and making existing CMOs more detailed, until these contradictions subsided. For example, I initially had somewhat contradictory CMOs related to commissioners' usage of the external providers of data, which commissioners appeared to find useful since they provided new analytical skills, but another CMO suggested commissioners were simultaneously sceptical of external providers. Eventually, after revisiting the original articles and linking one of the CMOs in this category to a substantive theory, this apparent contradiction was resolved via the development of more refined CMOs.

Following this, all of the included studies were re-read one final time, and the identified relevant information from the articles (i.e. anything related to the research questions) was tested against the CMOs. If the information was explained by an existing CMO, no further analysis was undertaken, which was usually the case. In some cases, an element of an existing CMO was made slightly more abstract or was refined to incorporate the information.

At this point, a final process of *situating* and *consolidating* was completed across the CMOs, leading to the development of several larger and more complex CMOs in contrast to the more granular situation of CMOs. This meant that, as previously noted, some CMOs had either multiple mechanisms, as well as contexts, or outcomes. This challenge of identifying a single context, mechanism, and outcome

has been noted by other researchers, and it is possible for more than one mechanism to be at play at a time – this can have benefits in terms of providing a more holistic 'big picture,' or the researcher may choose to separate the components into more, simpler CMO configurations.[75,148,152]

Throughout this process, I regularly shared my draft CMOs both with my supervisors for comment, as well as with a small group of other realist doctoral researchers. They were able to provide helpful comments on elements of the CMOs that they felt were difficult to understand and provide suggestions for refinement. Appendix 3.2 provides simplified examples of CMO development.

3.2.5.3 The incorporation of substantive theories in CMO development

As previously noted, it was initially challenging to identify relevant substantive theories since these were not articulated in the NHS's own commissioning cycle and its guidance on the types of data that could be used to inform commissioning. In addition, many of the articles in the realist synthesis were atheoretical. At the outset of this thesis, I had anticipated that I would be able to identify several substantive theories via the included studies or that there would be one or more specific theories related to data usage (or at least evidence) in primary care commissioning articulated by the NHS. Although a few of the included studies mentioned relevant substantive theories, I also utilised additional methods to identify substantive theories to facilitate CMO development, namely:

- Drawing on theories from the realist literature (i.e. key texts written by theorists such as Pawson) that were applicable to my developing CMOs.

- Using reasoning from the ‘ladder of abstraction’ to help identify substantive theories from adjacent fields such as economics. This was guided by considerations (recommended by the literature) such as asking if certain themes and concepts could be explained using more abstract concepts going beyond specific explanations, and whether more abstract, common concepts might be applicable to CMOs.[101] This was an iterative process, whereby I tried to identify higher-level concepts or themes in one or more CMOs such as competition or peer pressure. I then completed online searches for potential substantive theories that could be linked to these concepts.
- Ongoing recommendations from my supervisors when reviewing my written work.
- Via the realist evaluation: one substantive theory was mentioned in interviews and subsequently located in the literature via internet searching.

This approach was applied to CMO development during the realist synthesis and evaluation. Even after using all these approaches, it was not possible to link every CMO to a substantive theory, meaning some CMOs were developed without any links to substantive theories but rather based on common sense explanations and the content of the included articles (in the case of CMOs developed during the synthesis) or interview and meeting content (in the case of CMOs developed during the evaluation). An overview of which CMOs are linked to substantive theories and the origin of these substantive theories is provided in section 4.1.4.

3.3 Phase 2: realist evaluation

Realist evaluations are theory-driven, and, like realist syntheses, aim to explain how policies and interventions work, who they work for and in what circumstances.[124] This is achieved by collecting primary data from various sources (e.g. interviews with participants) to confirm, refute or test theories about a programme or intervention.[124] For my data analysis, I applied the realist logic of analysis described in section 3.2.5, as well as induction, deduction, retroduction and abduction during the realist evaluation (phase 2a, 2b, and 2c) described in sections 3.3.1 – 3.3.3.

3.3.1 Phase 2a: realist evaluation – meeting recordings and minutes

3.3.1.1 Background - obtaining content and consent

Prior to the beginning of the COVID-19 pandemic, Primary Care Commissioning Committee meetings were held at CCGs in person, and any member of the public could attend and observe these meetings. Once the COVID-19 pandemic started, in-person meetings were cancelled, but as the pandemic progressed CCGs increasingly began making the recordings of and minutes from their Primary Care Commissioning Committee meetings available online.

I searched the websites of all CCGs in England as well as Google and YouTube with the aim of identifying as many meeting recordings and minutes as possible. I did this on an ongoing basis between June 2020 and April 2022, and all the content identified is from meetings that took place within this time period, i.e. I was not able to locate any recordings of meetings that had taken place prior to the COVID-19 pandemic. I only transcribed and analysed content from the recordings and minutes

that specifically related to the usage of data to inform primary care commissioning decisions.

The MSD Ethics team advised, in line with the University's Central University Research Ethics Committee best practice guidance on Internet-mediated research, that I should make a 'reasonable attempt' to contact the people whose anonymised quotes I wished to use to give them the option to opt-out, as well as the (former) chairs of the CCGs whose content I wished to quote. This is because although the quotes were not linked to any specific names or roles, and I attempted to remove any identifying details such as place names, there is the potential for members of the public to link the quotes back to individual commissioners by listening to meeting recordings as well as reading this PhD thesis or resulting publications and identifying overlaps between the recordings and the quotes. I adhered to this guidance and attempted to contact all the CCG chairs and individual commissioners (by using the contact details available on the websites of (former) CCGs) whose meeting contributions I have used. one chose to opt-out, although several commissioners asked to view the quotes, and one commissioner asked for a phrase to be capitalised. The (former) Ealing CCG stated that documents from the CCG were allowed to be quoted as they are materials in the public domain, but asked for links to the original to be given. The link to the recording has since been removed from their website, however the quotes from meeting 22 (CCG 7) are from the (former) Ealing CCG's December 2020 primary care commissioning meeting.

3.3.1.2 Overview of meeting content used

In line with the ethical approval granted, I pseudonymised this content as much as possible by omitting the names of CCGs and commissioners from the quotations, instead assigning pseudonyms (table 2). I also removed any content from the minutes and recordings that could jeopardise anonymity such as the names of people or places or CCG-specific programmes. I accessed content from 51 meetings across 18 different CCGs. 33,998 words were transcribed. The recording duration is unavailable for nine meetings since this was removed while I was completing my DPhil. 175 minutes and 10 seconds worth of content was transcribed from the remaining 42 meetings.

Table 2: Overview of meeting content transcribed and analysed

Name of meeting	Meeting recording accessed and used in analysis?	Meeting minutes accessed and used in analysis?	Meeting abbreviation (used for quotes in chapter 4)	Approximate duration of recording transcribed (MM:SS)	Words transcribed for analysis	CCG pseudonym
Meeting 1	✓	✓	M1	03:23	468	CCG 4
Meeting 2	✓		M2	02:39	513	CCG 12
Meeting 3	✓	✓	M3	03:21	605	CCG 10
Meeting 4	✓	✓	M4	06:53	1031	CCG 10
Meeting 5	✓	✓	M5	17:00	3099	CCG 18
Meeting 6	✓	✓	M6	05:00	868	CCG 2

Meeting 7	✓	✓	M7	Recording no longer available	193	CCG 12
Meeting 8	✓		M8	01:34	246	CCG 12
Meeting 9	✓		M9	Recording no longer available	354	CCG 15
Meeting 10	✓		M10	03:17	489	CCG 12
Meeting 11	✓		M11	03:19	555	CCG 10
Meeting 12	✓		M12	Recording no longer available	1329	CCG 11
Meeting 13	✓		M13	00:57	198	CCG 12
Meeting 14	✓	✓	M14	01:56	247	CCG 8
Meeting 15	✓		M15	05:14	711	CCG 12

Meeting 16	✓		M16	09:19	1554	CCG 12
Meeting 17	✓	✓	M17	Recording no longer available	255	CCG 1
Meeting 18	✓	✓	M18	Recording no longer available	473	CCG 15
Meeting 19	✓	✓	M19	10:04	1321	CCG 16
Meeting 20	✓		M20	Recording no longer available	448	CCG 17
Meeting 21	✓		M21	02:30	444	CCG 6
Meeting 22	✓	✓	M22	Recording no longer available	959	CCG 7
Meeting 23	✓		M23	02:10	324	CCG 8
Meeting 24	✓		M24	00:32	115	CCG 12

Meeting 25	✓		M25	03:41	676	CCG 18
Meeting 26	✓		M26	09:58	1263	CCG 10
Meeting 27	✓		M27	03:07	511	CCG 13
Meeting 28	✓	✓	M28	02:06	361	CCG 6
Meeting 29	✓		M29	00:42	131	CCG 9
Meeting 30	✓	✓	M30	00:34	127	CCG 14
Meeting 31	✓		M31	Recording no longer available	1345	CCG 17
Meeting 32	✓	✓	M32	04:21	723	CCG 18
Meeting 33	✓		M33	02:04	379	CCG 15
Meeting 34	✓		M34	01:00	179	CCG 3
Meeting 35	✓	✓	M35	07:29	1365	CCG 8

Meeting 36	✓	✓	M36	00:50	178	CCG 12
Meeting 37	✓	✓	M37	10:23	1593	CCG 12
Meeting 38	✓		M38	Recording no longer available	443	CCG 6
Meeting 39	✓		M39	03:43	649	CCG 12
Meeting 40	✓		M40	4:44	932	CCG 5
Meeting 41	✓		M41	02:11	291	CCG 12
Meeting 42	✓		M42	03:11	496	CCG 12
Meeting 43	✓		M43	11:26	1639	CCG 10
Meeting 44	✓	✓	M44	3:51	581	CCG 14
Meeting 45	✓		M45	00:58	172	CCG 5
Meeting 46	✓		M46	02:17	448	CCG 5

Meeting 47	✓		M47	02:08	382	CCG 6
Meeting 48	✓		M48	10:09	1510	CCG 10
Meeting 49	✓		M49	0:27	75	CCG 6
Meeting 50	✓	✓	M50	03:53	615	CCG 12
Meeting 51	✓		M51	00:49	135	CCG 15

3.3.2 Phase 2b: realist evaluation - interviews with commissioners

3.3.2.1 Preparation for phase 2b: initial interviews with PPI contributors

Patient and Public Involvement (PPI) is the involvement of patients, carers, and members of the public as active partners in the design of research. This has several purported benefits, including making research more relevant, participant friendly, and enabling the researcher to better understand the views and experiences of people who use a service or receive an intervention or treatment.[153,154] There is a distinction between PPI in clinical research, which usually focusses on patients, and implementation research, which is the study of methods to promote the uptake of research findings into practice and usually focuses on understanding and changing the behaviours of health professionals.[155] My DPhil research is not clinical and does not involve patients, but its aims align with at some of those of implementation research, since I am trying to understand what promotes and inhibits the usage of a form of evidence in commissioning practice, as well as understanding the actions of commissioners. There is uncertainty about the role of PPI in implementation research, and, according to one study involving experienced PPI contributors and researchers embedded within an NIHR-funded programme of implementation research, there is more uncertainty about PPI in implementation research compared with clinical research.[155] However, PPI can still be helpful in implementation research in many ways, including providing insight into how interventions may be received and helping share research questions, and researchers must consider how to best tailor involvement according to the requirements of their research projects.[155]

Although my research topic does not have a clear end user or patient focus, I wanted to conduct PPI prior to commencing my interviews by asking participants to comment on the relevance and appropriateness of my proposed interview questions and research topic, and gain their views on the factors that promoted and inhibited data usage in commissioning in order to ensure my interview questions and topics were relevant and acceptable. I felt that an appropriate group of people to consult about this topic were people who provide PPI for NHS commissioning. CCGs and NHS England have a legal duty to involve people in the commissioning of health and care services, and the purpose of public involvement in NHS commissioning is to enable people to share their views, needs and wishes, and to contribute to plans, proposals, and decisions about the commissioning of services, which can help commissioners better understand population health needs.[156] I believed that this group was appropriate since they understood the concept and importance of PPI, and likely had significant experience of working with commissioners and attending commissioning meetings.

I began my DPhil by conducting three interviews with people who had experience of providing PPI for NHS commissioning of primary care services. These interviews took place remotely using Microsoft Teams in October 2020 and had an average interview duration of 00:52:14 (table 3). These interviews were of an exploratory nature, and were used to explore which documents, research, and data interviewees had used during their involvement in commissioning, the types of evidence they had witnessed other commissioners use, and if they believed the phrasing of questions could be improved, and if they believed there were certain topics that should be addressed in subsequent interviews when interviewing people with experience of

providing PPI for the NHS commissioning of primary care services cycle. The logistics of the interviews (e.g. obtaining consent, transferring the recordings, etc.) were identical across all interview types.

Table 3: Overview of interviews with PPI contributors

Date of interview	Abbreviation for citations in chapter 4 (CMOs)	Interview duration (HH:MM:SS)
16/10/2020	PPII1	01:12:05
20/10/2020	PPII2	01:00:14
26/10/2020	PPII3	00:24:24

3.3.2.2 Interviewees

In realist interviews, interviewees should be selected based on their ability to confirm, falsify and refine theory.[73] An interviewee should be able to describe in a detailed manner the way in which their reasoning contributed to the observed outcomes or change.[157] An expert can be defined as someone who is responsible for the development, implementation, or control of a policy, as well as a person who has privileged access to information about groups of persons or decision processes.[158] Two types of experts were consulted for interviews: firstly, commissioners of primary care services, who had in-depth knowledge of commissioning processes and the usage of data in commissioning since it was part of their job (this type of expert is covered in section 2b – the second type of expert, namely experts on evidence based commissioning, is covered in section 2c). For 2b, both people working as NHS commissioners of primary care services (at the time the research was conducted) as

well as those with previous experience of working in NHS commissioning of primary care services were eligible.

3.3.2.3 Purposive sampling

Purposive sampling was used to select interviewees. A realist sampling strategy should enable the testing of contexts.[159] Purposive sampling can be based on different criteria, including the desire to maximise variability to discover if a programme succeeds across a whole spectrum of sites.[160] Purposive sampling is not random and aims to ensure that specific kinds of cases are included in the final sample and assumes that different kinds of people may hold different views and ideas about the research topic.[161] This can be done with an emphasis on variation, enabling the researcher to see shared patterns that cut across cases and have emerged from heterogeneity, and allows the researcher to consider a problem from different angles.[162,163] By selecting dissimilar settings in a systematic fashion, researchers can discover what their concepts have in common across settings and contexts, as well as features potentially unique to one context.[164]

I used three criteria to classify interviewees and ensure at least some degree of variation was obtained:

- Financial performance of their CCG: the NHS Oversight Framework in 2019/20 comprises indicators to oversee organisational performance and identify where commissioners may need support (full details available here: https://www.england.nhs.uk/wp-content/uploads/2020/01/NHSOF-CCG-Measures-Technical-Annex-1920-v1.5.pdf). Finance has been recognised as a key context within the realist synthesis, and two indicators provide an

indication of a CCG's financial performance. These are (1) In-year financial performance (141b – this indicator assesses the CCG's actual and forecast financial performance and is assessed on a scale of 1-3 or red, amber, green) and (2) Quality of CCG leadership (165a – this indicator provides an indication of how well senior leaders of a CCG, both clinicians and managers, are performing their leadership role, including leadership in finance and is assessed on a scale of 1-4). The commissioners interviewed were from CCGs that have achieved at least two different ratings across both indicators (data publicly available for download here: https://www.england.nhs.uk/publication/ccg-iaf-data-extract/)

- Geographic location: interviewees who have worked at CCGs in at least four different counties were chosen to increase geographic differences
- Job title: I aimed to interviewee commissioners from as wide a range of backgrounds (e.g. finance, management, clinical, data science, etc.) as possible, since initial findings from the realist synthesis suggested that a commissioner's background could influence their approach to using data

I have not listed these characteristics in the interviewee table due to the risk of this information compromising the interviewee's anonymity, but it was captured on a password protected excel file stored on a university server that my supervisors have access to.

3.3.2.4 Identifying interviewees

I used several approaches to identify potential interviewees. Firstly, I asked my existing contacts to introduce me to commissioners who might be interested in my study. Secondly, I asked interviewees to introduce me to potential interviewees (snowballing). Thirdly, I approached several CCGs directly via email, and asked if they could circulate the details of my study to any potentially interested interviewees.

3.3.2.5 Sample size and data saturation

In line with most qualitative methodologists, realists cannot prescribe a set number of interviews to be completed, but rather advocate for gathering sufficient amounts of primary and secondary data, ideally from different sources, to refine and consolidate programme theory.[159,165] Conducting more interviews in realist research is not necessarily better: the unit of analysis is not the interviewee but rather the events and processes they have knowledge of.[165] The expertise of the interviewees, who have experienced successes and failures and awareness of the people and places for whom and in which programmes work, provides the tools for hypothesis refinement in realist interviewing.[73,159] A guiding principle for the sample size of interviews was therefore having access to a diverse range of commissioners, as I believed this would correlate with a wide range of experiences (see section 3.3.2.3 for more detail on purposive sampling).

As described, although it is not possible to determine an exact number of interviews a realist research should complete, some realist studies[166,167] have used models such as ‘information power’ to help guide and justify the sample size used during primary data collection. I considered the conceptual models of information power as

well as Morse's guidance on sample size. The concept of information power states that the larger information power the sample holds, the lower N is needed, and vice versa.[168] This aligns with guidance from realist methodologists, who state that more interviews are not necessarily considered better by realists, as the amount of detailed knowledge a participant has about a programme is more relevant than the number of interviews conducted.[165] Information power notes five dimensions that help estimate the required sample size for interviews, namely: study aim (a broader aim necessitates a larger sample size); sample specificity (participants with characteristics highly specific for the study mean a less extensive sample is required), theoretical background (a study supported by limited theoretical perspectives would usually require a larger sample size); the quality of dialogue (a stronger and clearer dialogue in the interview means fewer interviews will be required); and the analysis strategy (a study aiming for an exploratory cross-case analysis will require a larger sample size than one aiming for in-depth analysis of a few informants).[168,169]

Morse provides the following factors to consider when determining sample size: scope of the study (the broader the scope of the research question, the longer it will take to reach saturation), the nature of the research topic (a clear and obvious research topic will mean information is easily obtained in the interviews), quality of data (this relates to participants' ability to reflect on the topic and express themselves, whereby richer and higher quality data necessitates fewer interviews), study design (a longitudinal design in which a group is the unit of analysis will require a smaller sample size than one in which there is one interview per participant), and the availability of shadowed data (if interviews reveal something about others'

perspectives, in addition to the interviewee's own, the required sample size may be smaller).[170] Although the interviewees were able to provide rich, detailed, and reflective content in interviews, my study aim and scope was broad, the study content was complex, and interviewees focussed on their own experiences, hence both conceptual models suggested I should aim to conduct a larger number of interviews.

3.3.2.6 Realist interviewing

All interview data in the realist evaluation were collected using the realist interviewing approach. The purpose of the realist interview is informed by theory: the researcher's theory is the subject matter of the interview, and the interviewee is there to confirm, falsify and refine the theory.[157] Realist methodologists suggest a three-phase interview model, consisting of initial *theory gleaning* interviews, where respondents are expected to help the researcher articulate first order theories about intervention modalities, actors, contexts, mechanisms and outcomes, *theory refinement* interviews whereby the interviewee validates, disqualifies or modifies the researcher's theories, and finally *theory consolidation* interviews, where key theories are more thoroughly explored and fine-tuned.[117,159]

Since I began my DPhil with a scoping of the literature as well as two informal discussions with commissioners followed by a realist synthesis, I had draft CMO configurations prepared prior to commencing interviews. I therefore started doing theory refinement from the first interview onwards in the sense that I was already presenting the preliminary CMO structure to the interviewee for comment. I completed my primary data collection and analysis (as well as further and refined

analysis of the literature in the realist synthesis) in parallel to conducting interviews, and updated my interview questions accordingly to help fine-tune CMOs (appendix 3.2 contains sample interview questions). In addition, I asked participants to comment on aspects of CMOs I thought they would have particularly in-depth knowledge of, such as asking an interviewee from a CCG whose meeting recordings I had listened to comment on a topic discussed in the meetings.

A key feature of realist interviewing is the teacher-learning function: interviewers are encouraged to play an active and explicit role in teaching the overall conceptual structure of the investigation to the interviewee by presenting the respondent with a formal description of (part of) the parameters of the initial programme theory for examination.[117,157] In other words, the interviewer should not assume a position of naivety, but rather 'teach' the preliminary theory developed elsewhere to the interviewee for comment and refinement, for example in the form of beginning a question with the statement of 'this is how we think this intervention works...'[117] Each question posed should relate to an element of the programme theory, and interviewees should be encouraged to tell stories about specific experiences or issues with the programme, its participants, and constraints.[165] Interviewers are encouraged to present multiple and contradictory theories in an interview to attempt to avoid 'leading' the interview, and although the ideas and theories about how a programme or intervention works should be made explicit to the interviewee, they do not have to be described as contexts, mechanisms or outcomes.[165]

I attempted to incorporate these principles into my interviews by e.g. outlining a scenario relating to the usage of data that I had come across and the purported

mechanisms at play, which could be something such as trust or perceived utility, although I did not specifically call it a mechanism. I then asked the interviewee's opinion on the accuracy of my statements and how they thought particular scenarios might play out in practice, and what aspects of my hypotheses they agreed and disagreed with. I encouraged interviewees to provide specific stories and examples, and followed up and probed for more detail where possible. Knowing that my questions only covered the (developing) CMOs, at the end of every interview I asked the interviewees if there were any challenges or scenarios relating to utilising data they wished to discuss that had not been covered in the interview. If the interviewee affirmed this, I attempted to further explore this with them and in subsequent interviews.

The commissioners had both clinical and non-clinical backgrounds and worked a range of areas including finance, information management, etc. Although I did not capture the interviewees' exact job titles during the interviews, I have listed the area of commissioning they worked in and general background (where possible) in table 4 based on the information provided in interviews. This may not reflect the interviewee's current job title/area of work, and they may have additional experience of working in other areas.

Table 4: commissioner interviews

Interviewee	Date	Abbreviation for citations in chapter 4 (CMOs)	Area of commissioning/background	Interview duration (HH:MM:SS)
Interviewee 1	06/11/2020	CI1	Population Health and Finance Manager	00:54:36
Interviewee 2	09/11/2020	CI2	Clinician, has held multiple commissioning roles including non-Executive in a PCT	01:02:17
Interviewee 3	12/11/2020	CI3	GP, has held multiple commissioning roles including medicines commissioning	01:15:53
Interviewee 4	30/11/2020	CI4	Deputy Director of Finance for a CCG	00:59:09
Interviewee 5	01/12/2020	CI5	Multiple roles, included chair of a primary care commissioning group and Chief Executive of a Health Authority	00:45:35

Interviewee 6	03/12/2020	CI6	Quality improvement work (GP by background)	00:55:07
Interviewee 7	17/12/2020	CI7	30+ years of work experience in the NHS in policy, commissioning and change management roles	00:49:52
Interviewee 8	23/12/2020	CI8	Former Director of Commissioning for a CCG	00:43:49
Interviewee 9	28/01/2021	CI9	Consultant for the NHS/CSUs	00:41:44
Interviewee 10	29/01/2021	CI10	Director	00:44:38
Interviewee 11	11/03/2021	CI11	N/a – asked for this information to be removed	00:52:27
Interviewee 12	30/03/2021	CI12	Associate Director	00:21:54
Interviewee 13	23/08/2021	CI13	Chair, clinical commissioner (GP)	00:48:44
Interviewee 14	01/09/2021	CI14	Clinical commissioner (GP)	00:34:29
Interviewee 15	30/11/2021	CI15	Manager	00:33:22
Interviewee 16	14/12/2021	CI16	Assistant Director for Primary Care	00:39:50

Interviewee 17	25/01/2022	CI17	Manager	00:32:53
Interviewee 18	21/01/2022	CI18	Estates (Primary Care), Deputy Director	00:33:59
Interviewee 19	12/01/2022	CI19	Associate Director	00:26:59
Interviewee 20	09/02/2022	CI20	Head of Primary Care Commissioning, clinical background	00:23:23
Interviewee 21	15/02/2022	CI21	Leadership/management role	00:10:38
Interviewee 22 & 23 (joint interview)	09/03/2022	CI22	Management/Director level roles (both interviewees)	00:24:25

3.3.2.7 Logistics of interviewing

In line with university guidance for conducting research during COVID-19, I completed all interviews remotely using either Microsoft Teams (for video calls) or using a phone. The interview duration ranged from 00:10:38 to 01:15:53. I gave interviewees the option of providing either written or oral consent. I audio-recorded the interviews on two recording devices (a password protected phone and a voice recorder). I gave interviewees the option to not have the interview recorded, in which case I would have taken written notes instead, but all interviewees opted for a recording. Following the interviews, I uploaded the recordings onto secure university servers and deleted the recordings from the devices. I sent the recordings in an encrypted and password-protected 7-zip file to a university approved transcriber via Oxfile. The recordings were saved as files that included only the date (e.g. 'interview 09-01-2021, v_1') and stored on a password protected folder on a university network drive. The actual names of the interviewees were linked to the recordings on a password protected excel sheet stored on a university network drive.

Once I received the transcript of the recording, I double-checked the transcript for any information that could potentially compromise the anonymity of the interviewee (the transcriber also attempted to do this). The transcriber had a very verbatim approach to transcription and tended to include many pause fillers such as 'um' and 'err' in the transcripts. I removed the majority of these since I felt they disrupted the fluidity of reading in the analysis of the transcripts, and I did not feel that removing them compromised the findings. I subsequently notified the interviewees that their transcript was complete, and that they could review it if they wished to.

If the interviewee requested to review the transcript I shared it via Microsoft 365 OneDrive for business using the sharing link for 'specific people,' i.e. only people with a specified email address were allowed to look at the document. Interviewees were given the option to correct factual inaccuracies in the transcript or request the removal of information they felt could compromise their anonymity, in line with university guidance on conducting interviews. Two of the three interviewees who completed the PPI interviews asked to review the transcripts but did not request any changes. 10 of the 23 commissioners interviewed asked to review the transcripts. One interviewee requested the removal of pause fillers, which would have been completed anyway, and asked for the description of a QOF to be amended, as it had been incorrectly described as a local incentive rather than a national incentive scheme. One interviewee asked to be contacted once I had decided which quotes to include in the final DPhil and any publications as they wished to review them.

3.3.3 Phase 2c: realist evaluation – interviews with experts on evidence-based commissioning

As discussed earlier, an expert can be defined as someone who is responsible for the development, implementation, or control of a policy, as well as a person who has privileged access to information about groups of persons or decision processes.[158] I completed a small number of interviews with researchers with expertise of evidence-based commissioning, who fall into the latter group of experts i.e. those with privileged access to information about commissioners, gained by doing research on this topic including collecting and analysing primary and secondary data. To be eligible for an interview, experts had to have experience of conducting research on

the usage of evidence in commissioning of primary care services, evidenced through at least one peer-reviewed publication on this topic, as well as experience of collecting and analysing some form of primary data in the field of evidence usage in commissioning of primary care services, e.g., through the observation of commissioning of primary care services meetings, interviews with commissioners, etc.

The interviews with the experts took place once the CMOs were in an advanced stage of development (see appendix 3.3. for sample interview questions). Discussing the CMOs with a small number of researchers in addition to commissioners offered several novel insights as well as combatting threats to validity that may have been present in other primary data sources, namely that the researchers had experience of observing and analysing commissioning of primary care services processes across a larger range of organisations than the average commissioner, that they were able to provide insights on commissioning of primary care services processes as an 'outsider' (in contrast to the commissioners interviewed who provided insights on the usage of evidence in commissioning of primary care services as 'insiders'), and that some of them had experience of applying theoretical frameworks or explanations to the usage of evidence in commissioning of primary care services that they were able to share.

I began drawing up a short-list of potential expert interviewees in early 2022. I added potential interviewees to the list based on how well I thought they could contribute to the refinement of the programme theory, based on the amount and richness of

research they had completed on this topic as well as their self-professed expertise and research interests (based on their publications and/or websites).

The logistics and practicalities of the expert interviews were similar to those outlined in section 2b (interviews with commissioners). I recruited interviewees by approaching them via email and explaining my study, and the consent, recording and transcription processes were identical to those outlined in section 2b. All interviewees opted to have the interviews recorded. In total, three interviewees requested to view the transcript. One asked for a transcription error to be corrected. The interviewees were currently employed across six different universities (with one interviewee being a former academic) and had all published at least one peer-reviewed article about the usage of evidence in commissioning.

The interviews were also realist in nature, and because the CMOs were already in an advanced stage of development, the emphasis of the interviews was in line with the third and final phase of realist interviewing, namely theory consolidation. Theory consolidation interviews focus on conceptual focussing to clarify and confirm details of CMOs, and interviewees may either provide further detail and refinement for more tentative CMOs, or refute aspects of hypotheses by providing falsifying examples.[117,159] Similar to the interviews outlined in section 2b, I used the realist 'teacher-learner' function to present or 'teach' the interviewee the theory (or CMO) for comment, and the interviewee offered their own views to refute, refine or enhance my hypotheses. Some interviewees requested to review a list of hypotheses and topics for discussion prior to the interview (usually because they wanted to spend time reflecting and thinking prior to the interview, and/or because their primary data

collection in the field was several years ago) which I shared with them in due course. The interviewee durations ranged from 00:23:09 to 00:56:58 (table 5). All interviewees except one (who used to work for a university but had since left academia) worked at universities in the UK, with job titles including Associate Professor, Professor and Research Fellow. Due to the limited amount of people conducting research on NHS commissioning, I have not linked exact job titles to quotes to reduce the risk of re-identification.

Table 5: Overview of interviews completed with experts on evidence-based commissioning

Interviewee	Date	Background	Abbreviation for citations in chapter 4 (CMOs)	Interview duration (HH:MM:SS)
Interviewee 1	16/02/2022	Academic at a university	EI1	00:56:58
Interviewee 2	21/03/2022	Former academic	EI2	00:27:25
Interviewee 3	30/03/2023	Academic at a university	EI3	00:23:09
Interviewee 4	31/03/2022	Academic at a university	EI4	00:30:13
Interviewee 5	20/04/2022	Academic at a	EI5	00:20:30

		university		
Interviewee 6	26/04/2022	Academic at a university	EI6	00:24:33
Interviewee 7	28/04/2022	Academic at a university	EI7	00:40:38

3.4 Phase 3: comparison and consolidation of findings

This section beings by introducing the concepts of the iterative convergent (concurrent) approach and the associated constant comparison method. I then define the concept of triangulation and explain how a matrix can be used to display research findings from different sources. After defining these concepts, I outline how I combined an iterative constant comparison approach with a coding matrix for my analysis and to display my CMOs. I also provide my rationale for using this method of analysis and highlight its benefits.

3.4.1 Theory and definitions

3.4.1.1 Definition of the iterative convergent (concurrent) approach

In an iterative convergent (or concurrent) design, data are collected using different methods and analysed in a similar or simultaneous timeframe – this can continue cyclically through multiple rounds of data collection and analysis.[171,172] This typically consists of mixing qualitative and quantitative data collection methods.[171-173] Although my three methods of gathering and analysing evidence (realist synthesis i.e. secondary literature, interview and meeting evidence) were all qualitative, I felt

that the principle of convergent design and its benefits were applicable to my research. Rather than allowing separate findings to emerge and then be compared, the iterative approach involves the data 'talking to each other' during the data collection and analysis, meaning data are actively and interactively compared and considered.[171,174] The data interact in multiple phases to inform the final results.[172] Also called 'cross-track' analysis, this has the potential to enrich the understanding of a phenomenon by using findings from one data method to better understand the findings from another, e.g. using surveys to elaborate and expand on questions addressed in site visits, or using surveys or database findings to help direct interviews.[173]

3.4.1.2 Definition of the constant comparison method

Related to the convergent (concurrent) approach is the constant comparative method, based on the principle that comparing and contrasting can help refine categories, discover patterns, and establish the boundaries of categories.[175] Boeije's (2002) guidance offers a range of proposed questions for the researcher to consider to facilitate this, such as comparing themes across different data sources or methods, considering what new information found using one method could add to another, attempting to identify potential contradictions, and comparing themes found in one source to those found in another.[175]

3.4.1.3 Triangulation

3.4.1.3.1 Definition of (multiple) triangulation

Triangulation is the combination of two or more data sources, methodologies, or analytical methods within the same study.[164,176] Denzin (1978) defines several types of triangulation, including data source and methodological triangulation,[164] both of which were used in this DPhil. This is therefore considered multiple triangulation, i.e. the combination of multiple triangulation types in one research project.[164]

3.4.1.3.2 Data source triangulation

Three types of data sources are time (the times when data were collected), space (place or setting), and person (from whom the data were collected).[176,177] By selecting dissimilar settings, researchers can discover what their concepts have in common across settings.[164] Data source triangulation can consist of researchers aiming to maximise the different areas or settings in which data are collected about the same topic, and attempting to see if similar findings occur.[164,176]

The principle of attempting to collect data from a wide range of sources was applied throughout my primary and secondary data collection – the data collected in the realist synthesis were secondary data and spanned all three of these data sources (time, space – the location of the commissioning decision, and person – the individual commissioners). The primary data collected in phase 2a (meetings) were from the same 2-year timeframe (2020-2022), but were collected from a wide range of CCGs. The interview data (2b and 2c) were collected from a wide range of experts and commissioners who had knowledge and experience of many different CCGs and their predecessors gained over a range of time periods. Whilst I did not make a detailed comparison of every CMO across time, space, and person dimensions – this

would have been too time-consuming and could have breached the anonymity of certain people or CCGs – the principle of data source triangulation guided sampling strategy for the interviewees (see 'purposive sampling') and helped me identify patterns in my data.

3.4.1.3.3 Methodological triangulation

Methodological triangulation is also called multimethod triangulation, which uses multiple methods to study the same phenomenon.[176,178] Multimethod qualitative research is the combination of multiple qualitative methods,[179] which was used in this thesis as three qualitative methods were used, namely a realist synthesis, interviews, and analysis of meeting content.

3.4.1.3.4 Benefits and drawbacks of triangulation

Triangulation has several benefits, including the potential to help offset threats to validity present in certain data sources. Every method of data gathering has specific validity threats and flaws, and a finding that is present in multiple data sources can be viewed as stronger and more valid.[180] For example, descriptive validity describes the concern that people forget or unintentionally distort their experiences.[181] In addition, different methods allow for different nuances and angles to be visible, and can help the researcher access new knowledge, and mixing interviews with observations allows for an incorporation of the participants' verbal reflections on their situations.[179] However, different approaches can only help offset biases when the nature of the biases is understood, and using approaches with similar biases has the potential to reinforce the misleading or biased component of a result as much as or more than a single method.[182]

3.4.1.4 Coding matrix

A coding matrix can be used to systematically compare findings across different data collection methods.[183] It provides a way of displaying the findings from different sources (or data collection methods) in one place, followed by consideration and analysis of the levels of convergence (agreement between the different data collection methods), complementarity (similar or partial agreement between different data collection methods), silence (there are findings only present in some data collection methods) and dissonance (disagreement of findings across different data collection methods).[184,185] This approach is applicable to multimethod qualitative research, mixed methods studies, and realist research.[184,186] In the case of realist doctoral research, a matrix been used to compare CMOs developed using different primary and secondary data sources such as a systematic review and interviews.[186]

3.4.2 Application of the constant comparison approach and coding matrix in this thesis

3.4.2.1 The constant comparison approach

Although I had the aim of producing a coding matrix to compare the CMOs across the synthesis, interviews, and meeting content, I began by comparing and contrasting CMOs from these three sources by drawing on Boeije's constant comparison method.[175] The purpose of this was to enhance and refine the CMOs and use insights and findings from one evidence source to improve CMOs from the other source(s) without directly combining the CMOs, as well as test the CMOs

against information from other sources. Boeije offers specific steps and questions for the researcher to consider when using the constant comparison approach for qualitative research, which were adapted for realist research.

My starting point was three separate files for the three sources of content (synthesis, interviews, and meeting content) that were each analysed separately according to a realist logic of analysis (outlined in section 3.2.5) to form draft CMOs.

The first step was to compare the CMOs across these three evidence sources. If all three evidence sources contained the same CMO, no further analysis was completed, although this was rare when I initially began comparing and contrasting CMOs. In cases of complementarity, silence, or dissonance of CMOs across two or three evidence sources, the following analytical steps were taken (simultaneously and iteratively) to refine the CMOs:

- Considering if a substantive theory used to develop a CMO in one evidence source could be applied to the development of CMOs in different evidence sources. This could mean e.g. using a substantive theory found in the realist review to develop a CMO based on interview content.
- In cases of dissonance of CMOs between the different evidence sources, I applied Pawson's process of reconciliation (outlined in section 3.2.5.2) by further examining the material in the individual evidence sources to see if these contradictions could be resolved via refinement of the CMOs or the development of additional CMOs. For the CMOs developed based on interview content, the interview guide was updated to further probe these

apparent contradictions and use new insights from the interviews to either develop new CMOs or refine existing ones.

- In cases where CMOs were (partially) present in the realist synthesis and/or meetings but not the interviews, the interview guide was updated on an ongoing basis to ask interviewees about their experiences and ascertain if the same or a similar CMO could be developed based on interview content.
- If a CMO was (partially) present in one evidence source but not the others, the evidence source(s) where this CMO was not present was revisited to establish if information related to this CMO had been overlooked or missed during previous readings.

In addition, this comparative approach facilitated the identification of mechanisms and thus CMOs. As outlined in section 2.8.3, abductive or 'hunch informed' reasoning must sometimes be used to develop mechanisms. Sometimes, a mechanism found in one evidence source gave me an idea of a mechanism that could be applicable to or might be occurring in the other evidence sources and thereby facilitated the process of abduction and retroduction.

Using these steps informed both the development and discarding of certain (developing) CMOs. For example, as mentioned, several CMOs were further advanced and articulated via the 'cross-pollination' of substantive theories or because the constant comparison method facilitated abductive reasoning. However, there were also certain CMOs I had hoped to further develop using the constant comparison method that could not be. For example, an early draft CMO from the synthesis stated that a commissioners' background (e.g. whether they were

clinicians, managers, etc.) was linked to how they used and valued data. I hoped to gather more information in the interview and meeting content to further develop this CMO, but I could not find anything in the meeting content to corroborate this, and the interviewees did not have any strong opinions on this matter, other than agreeing that there might be some link between their background and how they used data, but they could not articulate this further. Eventually, this CMO was therefore discarded.

These steps were completed until it was no longer possible to gather any new primary and secondary data, i.e. after I had re-run my database searches for gathering secondary literature and completed as many interviews and searched for as much meeting content as possible. These steps were also iteratively completed until no new CMOs could be created and no further refinements to the CMOs were possible. After employing this approach there were no instances of dissonance, but not every CMO was present in every evidence source, and some CMOs were 'only' complementary i.e. similar but not identical across the sources or had instances of (partial) silence across the evidence sources. It was at this point that the CMOs were triangulated in the coding matrix (section 3.4.2.2) to compare the results.

3.4.2.2 Coding matrix

The CMOs are displayed in a coding matrix in chapter 4, followed by hypotheses about why some CMOs might not be identical across all three evidence sources. The annotation for this matrix is as follows (table 6).

Table 6: annotation matrix

Symbol	Meaning

✓	Evidence for CMO
=	Convergence: same CMO

+	Complementarity: partial agreement. This can be present when:
	• Part of the context, mechanism, or outcome is present in one CMO but missing in another. For example:
	  ○ CMO 1: context XYZ leads to mechanism A, outcome B
	  ○ CMO 2: context XY leads to mechanism A, outcome B
	  ▪ → CMO 1 and 2 are complementary
	  ○ CMO 3: context X leads to mechanisms A & B, outcome C
	  ○ CMO 4: context X leads to mechanism A, outcomes C & D
	  ▪ → CMO 3 and 4 are complementary
	• Contexts, mechanisms, and/or outcomes are similar but not identical

≠	Dissonance/discrepancy: • Same context, but 'opposite' mechanism or outcome, e.g. the same context and mechanisms leading to data being used in one evidence source, and data not being used in another
0	Silence: no evidence for this CMO

CMO configuration	Realist synthesis	Interviews	Meetings	Meaning
CMO 1	✓	✓	✓	The same CMO was found across all three evidence sources.

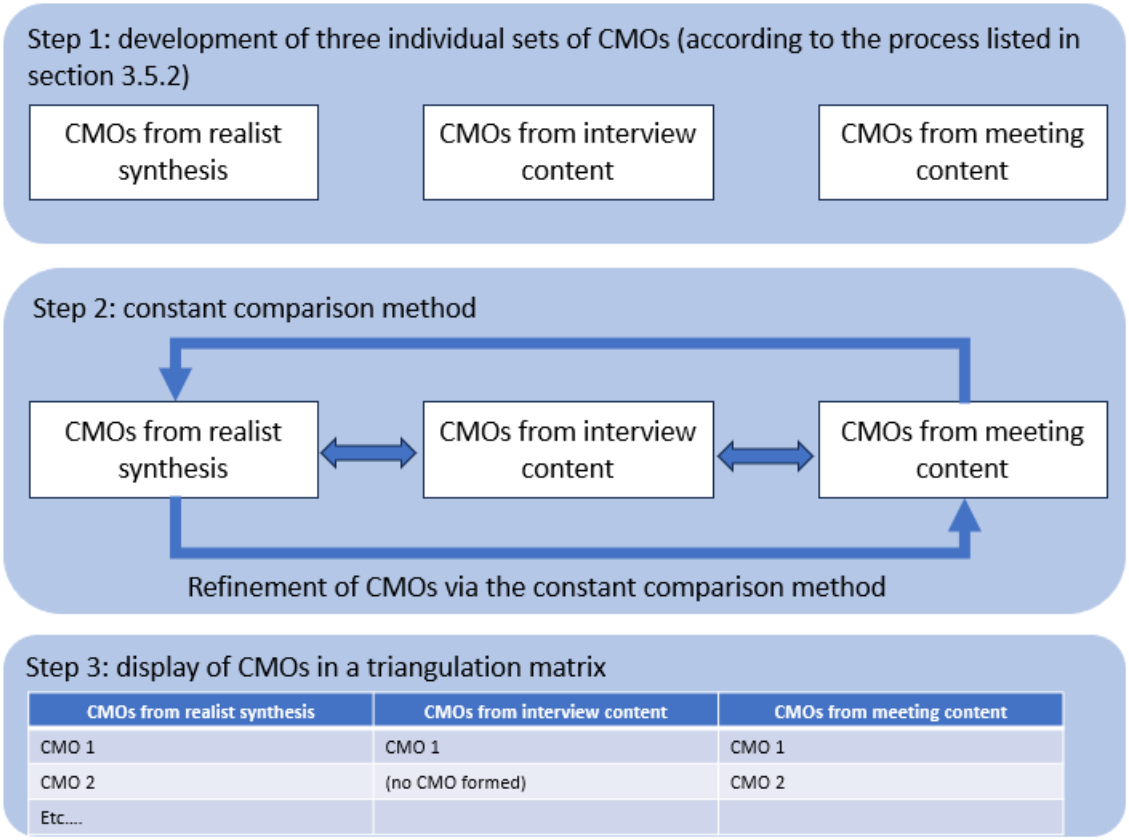
Table 7 provides examples of the way I have used the annotation system outlined in table 6 to explain which sources of evidence have contributed and in what way to the CMOs.

Table 7: examples of annotation matrix

CMO 2	0	0	✓	Evidence for CMO 2 was found only in the meeting evidence. There is no evidence for this CMO in either the synthesis or the interviews.
CMO 3	✓	+	=	CMO 3 is present in the realist synthesis. A similar CMO was discovered in the interviews. The same CMO (i.e. the same as in the synthesis) was found in the meeting content.

A visual summary of these steps is provided in figure 1:

Figure 2: summary of steps constant comparison method & matrix



CMOs from realist synthesis	CMOs from interview content	CMOs from meeting content
CMO 1	CMO 1	CMO 1
CMO 2	(no CMO formed)	CMO 2
Etc....		

3.4.3 Rationale for using the constant comparison approach and coding matrix

There were several methodological and visual benefits to combining the constant comparison approach with a subsequent coding matrix. Firstly, visually, this helps the reader quickly understand which CMOs are based on which sources of evidence and the amount of evidence underpinning each CMO. Visual displays of qualitative research represent analytical processes and help readers assess the credibility and dependability of the inferences made.[187] Therefore, the triangulation matrix gives readers some indication of how much evidence underpins each CMO, therefore allowing them to exercise caution or scepticism towards CMOs underpinned by fewer or only certain sources of evidence, should they feel this is warranted. It could

be argued that the CMOs identical across each of the three sources of evidence represent the strongest 'demi-regularities' i.e. the most frequently and strongly supported outcome patterns. A small number of CMOs were developed based only on content from one source and are therefore less 'regular' or strongly supported. The reasons for this are hypothesised in section 4.3.

Secondly, although the CMOs were not combined across the evidence sources, the outputs in the matrix are 'more than the sum of its parts:' through the constant comparison method, the CMOs are more refined and detailed than they would have been had the CMOs been developed completely independently of each other due to e.g. the 'cross-pollination' of substantive theories and the refinement of CMOs initially appearing contradictory.

A unique aspect of this thesis was the collection of one source of primary data (meeting content) covering one very short and defined recent period during a time of unprecedented strain (COVID-19) and by extension commissioning in the NHS. Some argue that it is only viable to combine different methods of collecting information under the premise that these methods are examining the same research problem[188] which in this thesis, rather uniquely for a doctoral realist thesis, they were not entirely since one evidence source was collected only during the COVID-19 pandemic and the other two were focussed predominantly on commissioning activities prior to the pandemic. Therefore, amalgamating the CMOs from the meeting content with others would have made it more difficult to understand which findings were 'COVID-19 specific.' Although much of the literature on triangulation does state that claims of credibility are strengthened when results converge across

multiple methods, using a transparent process to report findings can also lend credibility to results, with stakeholders (such as policy-makers) more likely to use findings whose creation they can understand and accept.[183] Therefore, for example, the meeting CMOs could be particularly useful to policy-makers operating in an exceptional circumstance such as during a future health emergency.

Using a triangulation matrix for results can facilitate further investigations, especially in instances of 'surprise silences.'[184] As will be outlined in more detail in the results section, the meeting evidence had the largest number of 'silences,' providing a warrant further research in a post-pandemic world where commissioning meetings may no longer be recorded and put online. A matrix clearly delineates the unique contribution each evidence source has made and allows for the consideration of a broader range of perspectives, although differences across sources of evidence may provide challenge to those who want to use triangulation for confirmatory aims.[185]

3.5 Primary data collection – adaptations due to COVID-19

Due to COVID-19, I had to significantly adapt my primary data collection methods. My original plan was to use three concurrent qualitative data collection techniques: interviews with multiple stakeholders, in-person meeting observations, and document analysis across several different CCGs, whereby each individual CCG would form a case study. I submitted the required ethics documents for this in early 2020 and was granted approval for these modes of data collection. I networked with several commissioners in the earlier phases of my research, and had unofficially 'recruited' one CCG to form a case study for my research after attending several of their commissioning of primary care services meetings and speaking to commissioners

who had expressed an interest in being interviewed. I also began networking with commissioners at another CCG, where multiple commissioners expressed an interest in being interviewed. However, once the COVID-19 pandemic began in the early 2020 this was no longer possible. CCGs initially cancelled their in-person commissioning of primary care services meetings, and many of the potential interviewees told me they no longer had time to be interviewed due to the exceptional strain COVID-19 had placed on the NHS.

I therefore had to come up with a primary data collection strategy (as outlined earlier in the chapter) that was flexible, fully remote, and could accommodate the unprecedented situation the NHS was operating in. Whilst I wanted to collect as much rich primary data as possible, I also did not want to overburden commissioners and put any unnecessary strain on NHS resources during a pandemic. By listening to recordings of meetings and analysing meeting minutes I was able to gather a large amount of primary data without putting any additional strain on NHS resources, as this information is freely available to all members of the public online. When conducting interviews with commissioners, I gave them the option of completing very short interviews so I did not take up too much of their time, and also interviewed some former commissioners, i.e. people who used to work in commissioning but had since retired or moved onto another line of work, to reduce the time active NHS staff had to spend on my study.

I received practical support throughout the pandemic from my supervisors, who provided feedback and suggestions on my proposals for redesign, the university ethics team, who reviewed and approved my amended ethics paperwork.

4. Findings of realist synthesis and evaluation

4.1 Overview and structure of findings

This chapter contains the findings of my realist synthesis and evaluation. I begin by presenting the outputs of the synthesis in section 4.1. I then present a CMO matrix (section 4.1.2) comparing the CMOs across all three evidence sources (synthesis, interviews, and meetings). In section 4.1.3, I outline the four conceptual categories into which the CMOs have been grouped, based on similarities in the contexts influencing how commissioners used data, namely (1) steps of the commissioning

cycle, (2) the characteristics of data, (3) commissioners' commissioners' capabilities, roles, perceptions, and intentions, and (4) commissioners' relationships with external providers. In section 4.1.4, I provide a summary of which CMOs have been informed by substantive theory and concepts from the broader literature. I then outline how I have used typographical emphases to illustrate how the CMOs compare across evidence sources (4.1.5) showing convergence, complementarity, dissonance, and silence of findings, and provide an overview of how I will compare these findings across evidence sources and how the final programme theory will be presented. The bulk of this chapter (section 4.2) focusses on the presentation of 37 CMOs, each accompanied by a narrative outlining which evidence sources (and where applicable which substantive theories) I drew on to develop it, as well as supporting quotations. Following the presentation of the CMOs, I hypothesise why some CMOs are not consistent across the evidence sources. Finally, I produce an overarching programme theory, and comment on how this links to the initial 'rough' programme theory outlined in chapter 2. My findings and this programme theory show that commissioners use data not only as a 'passive' source of evidence to draw on when making commissioning decisions, but also actively as a tool with the aim of stimulating improvements, as well as a warrant for decision making and a tool for persuading others.

4.1.1. Findings of realist synthesis

As outlined in chapter 3, I completed three searches (appendix 3.1) for my realist synthesis, identifying 3852 studies from databases and grey literature for screening

(figure 2). 92 studies fulfilled the inclusion criteria, outlined in table 7. Table 6 provides an overview of the types of studies included.

Table 8: study types, realist synthesis

Type of study	Number of studies
Qualitative research (case studies)	10
Grey literature (case studies)	9
Mixed methods research	8
Grey literature (mixed methods)	7
Multimethod qualitative research	5
Survey analysis	5
Qualitative research (interviews)	5
Descriptive piece	5
Multimethod (literature review and qualitative data)	4
Evaluation	4
PhD thesis	3
Grey literature (think tank piece)	2
Grey literature (interviews)	2
Literature review	2
Feasibility study (development of a tool to help commissioners)	2
Grey literature (multimethod qualitative)	2
Grey literature (opinion piece)	2
Systematic review	2
Framework development	1
Descriptive news article	1

Interrupted time series analysis	1
Longitudinal study	1
Briefing paper	1
Controlled before and after study	1
Qualitative research (ethnography)	1
Grey literature (policy paper)	1
Qualitative research (multimethod)	1
Grey literature (literature review)	1
Opinion piece	1
Grey literature (qualitative)	1
Grey literature (strategy piece)	1
Grand Total	92

Figure 3: PRISMA diagram

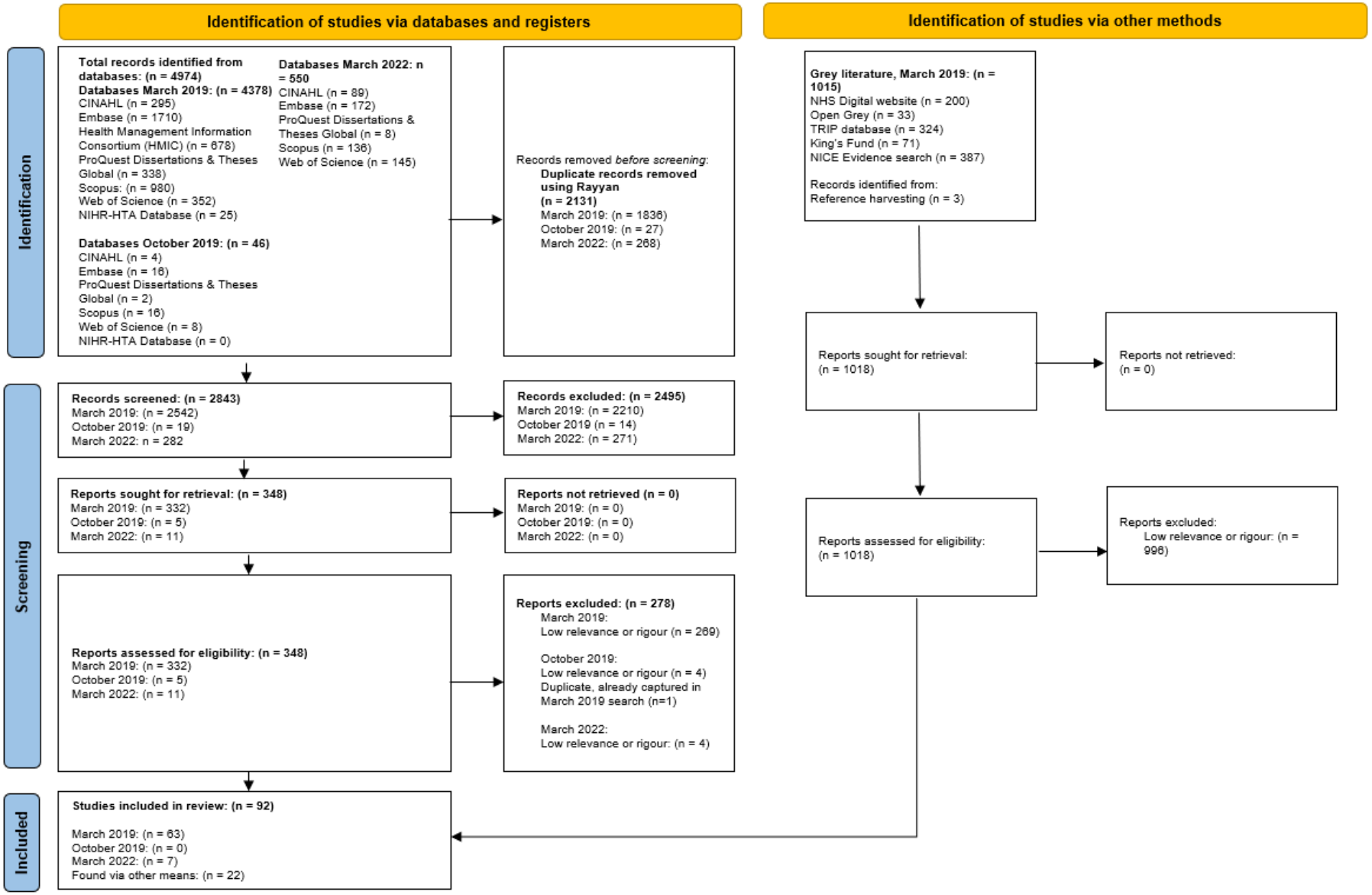

Identification of studies via databases and registers
Identification of studies via other methods
Identification
Screening
Included
Total records identified from databases: (n = 4974)
Databases March 2019: (n = 4378)
CINAHL (n = 295)
Embase (n = 1710)
Health Management Information Consortium (HMIC) (n = 678)
ProQuest Dissertations & Theses Global (n = 338)
Scopus: (n = 980)
Web of Science (n = 352)
NIHR-HTA Database (n = 25)
Databases October 2019: (n = 46)
CINAHL (n = 4)
Embase (n = 16)
ProQuest Dissertations & Theses Global (n = 2)
Scopus (n = 16)
Web of Science (n = 8)
NIHR-HTA Database (n = 0)
Databases March 2022: n = 550
CINAHL (n = 89)
Embase (n = 172)
ProQuest Dissertations & Theses Global (n = 8)
Scopus (n = 136)
Web of Science (n = 145)
Records removed before screening:
Duplicate records removed using Rayyan (n = 2131)
March 2019: (n = 1836)
October 2019: (n = 27)
March 2022: (n = 268)
Grey literature, March 2019: (n = 1015)
NHS Digital website (n = 200)
Open Grey (n = 33)
TRIP database (n = 324)
King's Fund (n = 71)
NICE Evidence search (n = 387)
Records identified from:
Reference harvesting (n = 3)
Records screened: (n = 2843)
March 2019: (n = 2542)
October 2019: (n = 19)
March 2022: n = 282
Records excluded: (n = 2495)
March 2019: (n = 2210)
October 2019 (n = 14)
March 2022: (n = 271)
Reports sought for retrieval: (n = 1018)
Reports not retrieved: (n = 0)
Reports sought for retrieval: (n = 348)
March 2019: (n = 332)
October 2019: (n = 5)
March 2022: (n = 11)
Reports not retrieved (n = 0)
March 2019: (n = 0)
October 2019: (n = 0)
March 2022: (n = 0)
Reports assessed for eligibility: (n = 1018)
Reports excluded: Low relevance or rigour: (n = 998)
Reports assessed for eligibility: (n = 348)
March 2019: (n = 332)
October 2019: (n = 5)
March 2022: (n = 11)
Reports excluded: (n = 278)
March 2019:
Low relevance or rigour (n = 269)
October 2019:
Low relevance or rigour (n = 4)
Duplicate, already captured in March 2019 search (n=1)
March 2022:
Low relevance or rigour: (n = 4)
Studies included in review: (n = 92)
March 2019: (n = 63)
October 2019: (n = 0)
March 2022: (n = 7)
Found via other means: (n = 22)

Table 9: Overview of included studies

Study name	Year published	Authors (note: authors are shown in the order listed on article)	Objectives	Setting/methods	Type of paper	Type of study
(Re)Surveying the Uses of Geographical Information Systems in Health Authorities 1991-2001	2003	Smith, D.P.; Gould, M.I.; Higgs, G.	To provide a comparative analysis of two separate national surveys of the uptake and use of Geographical Information Systems (GIS) by Health Authorities (HAs) in England and Wales	Cummins and Rathwell (1991) undertook an early study of the use of GIS by health organisations, on behalf of the Association of Geographical Information (AGI). A postal questionnaire was distributed amongst Information Technology/Services personnel working in the 104 HAs in England and Wales that were in existence during Summer 2001. This paper compares the 1991 survey results with the 2001 updated survey data.	Journal article, peer-reviewed research	Survey analysis
A matter of facts	2008	Dewhurst, R.	Opinion piece on world-class commissioning and	N/a - opinion piece	Opinion piece	Grey literature

			information in the NHS			(opinion piece)
Accountable to whom, for what? An exploration of the early development of Clinical Commissioning Groups in the English NHS	2013	Checkland K.; Allen P.; Coleman A.; et al	To explore CCG's developing accountability relationships.	The researchers carried out detailed case studies in eight CCGs, using interviews, observation, and documentary analysis to explore their multiple accountabilities.	Journal article, peer-reviewed research	Qualitative research (case studies)
Addiction to Medicine	2010	The National Treatment Agency for Substance Misuse	To provide: -An analysis of relevant National Drug Treatment Monitoring System (NDTMS) data and prescription data to investigate prevalence and trends -Structured interviews with targeted PCTs/partnerships to better understand the commissioning, governance (of prescribing and drug treatment provision) and provision of drug treatment services -To complete Surveys and structured interviews with	This report considers the problems encountered by the use of psychotropic and opioid analgesic medication (such as diazepam and tramadol) in the general population, (including that encountered by people reporting problems with illegal drugs) and the role of health services, including specialist addiction, pain and primary care services in order to address these issues.	NHS report (published by the National Treatment Agency for Substance Misuse)	Grey literature (mixed methods)

			specialist drug treatment providers and dedicated providers of treatment for POM/OTC medicines dependency to determine what is being provided and how local services are configured			
An exploratory study of the role and training needs of one primary care trust's professional executive committee members	2005	Offredy, M.	This paper provides a summary of an exploratory study based on an interpretive approach, aiming to elucidate how professional executive committee members of one primary care trust see their role and the training they need to fulfil their functions.	Using questionnaires and semi-structured interviews, the study examined the perceived training needs of the 26 participants.	Journal article, peer-reviewed research	Qualitative research (interviews)
An integrated treatment algorithm for pharmacotherapy and psychotherapy	1999	Kisely, S. R.; Jones J.	This paper describes how Birmingham Health Authority (HA), the largest HA in England and Wales with a population of just under one million, developed and implemented an evidence-based strategy for the use of psychotherapy services.	A literature search and health needs assessment for psychotherapy in Birmingham was performed.	Journal article, peer-reviewed research	Literature review
Building high-	2010	Naylor, C.;	The primary aim of this	The study was based	Grey	Grey

quality commissioning : what role can external organisations play?		Goodwin N.	research was to examine how, in the context of world class commissioning, external support is being used by PCTs and SHAs and whether it is helping to develop more effective commissioning.	primarily on interviews and focus groups with a range of stakeholders, as well as online surveys.	literature (King's Fund report)	literature (mixed methods)
Can general practice data be used for needs assessment and health care planning in an inner-London district?	1995	Scobie, S.; Basnett., I; McCartney, P.	To evaluate the quality of information in six computerized GP practices.	A comparison was carried out of the recording of registration and social information, health risk factors, medication and record on consultations on the computer and in the manual records for a sample of patients, with an audit of morbidity coding by computer. A comparison was made of computerised disease registers with prescribing for diseases.	Journal article, peer-reviewed research	Evaluation
Care home services at the vanguard: a qualitative study exploring stakeholder views on the	2018	Stocker R.; Bamford, C.; Brittain, K.; et al	To explore stakeholders' understanding of novel integrated approaches to enhancing care in care homes (a care home 'vanguard') and identify priorities for evaluation.	Qualitative study, using semistructured interviews with commissioners and service providers to/within care homes, and third sector organisations with thematic analysis in a CCG	Journal article, peer-reviewed research	Qualitative research (interviews)

development and evaluation of novel, integrated approaches to enhancing healthcare in care homes				area in England		
CCGs vary widely in how well they deliver healthcare, new measure shows	2016	Hawkes, N.	To analyse and describe how new indicators show that primary care clinical commissioning groups (CCGs) in England vary widely in their ability to deliver healthcare equitably to rich and poor people.	N/a - descriptive/opinion piece	Journal article, peer-reviewed research	Descriptive news article
Challenges to using evidence from systematic reviews to stop ineffective practice: an interview study	2013	Shepperd, S.; Adams, R.; Hill, A.; et al	To examine the challenges to using systematic review evidence to develop guidance for decommissioning ineffective health services, and the problems experienced by clinicians and commissioners when they attempt to implement the evidence from this guidance.	Completed interviews with 23 clinicians and 15 commissioners from nine commissioning organizations (Primary Care Trusts) in the south of England.	Journal article, peer-reviewed research	Qualitative research (interviews)
Clinical commissioning	2013	Naylor, C.; Curry, N.;	This report is based on fieldwork conducted before	The research is based on 74 in-depth interviews, 18	Grey literature	Grey literature

groups: Supporting improvement in general practice?		Holder, H.; et al	CCGs had become fully authorised. It provides an overview of developments through to March 2013, plus an assessment of the opportunities and challenges ahead.	direct observations and a survey of all general practices in our case study sites, to which there were 232 responses.	(King's Fund report)	(mixed methods)
Clinical governance, education and learning to manage health information	2011	Ellis B.; Howard, J.	This paper aims to suggest that the concept of clinical governance goes beyond a bureaucratic accountability structure and can be viewed as a negotiated balance between imperfectly aligned and sometimes conflicting goals within a complex adaptive system.	The study, located within the English National Health Service (NHS) between 1999 and 2005, is case study based using a multi method approach to data collection within two primary care organisations (PCOs).	Journal article, peer-reviewed research	Qualitative research (case studies)
Clinical leadership in service redesign using Clinical Commissioning Groups: a mixed-methods study	2018	Storey, J.; Holti, R.; Hartley, J.; et al	This research examined the extent to which, and the methods by which, clinicians stepped forward to take up a leadership role in service redesign using CCGs as a platform.	The project proceeded in five phases: (1) a scoping study across 15 CCGs, (2) the design and administration of a national survey of all members of CCG governing bodies in 2014, (3) six main in-depth case studies, (4) a second national survey of governing body members in 2016,	Report (NIHR)	Mixed methods research

				which allowed longitudinal comparisons, and (5) international comparisons.		
Commissioning and funding general practice: Making the case for family care networks	2014	Addicott, R.; Ham, C.	This paper describes the current system of commissioning and funding general practice and how this is being used in four areas of England to develop innovative models of primary care provision.	See objectives	Grey literature (King's Fund report)	Grey literature (opinion piece)
Commissioning for equity in the NHS: rhetoric and practice	2015	Wenzl, M.; McCuskee, S.; Mossialos, E.	To review evidence on equity as a policy goal of resource allocation in the English NHS, focussing on the role of CCGs and their capacity to achieve equity through the process of commissioning	Systematic review	Journal article, peer-reviewed research	Systematic review
Commissioning healthcare for people with long term conditions: the persistence of relational contracting in England's NHS quasi-market	2013	Porter, A.; Mays, N.; Shaw, S.E.. et al.	To examine the extent to which local commissioners have adopted a market-oriented (transactional) model of commissioning of care for people with long term conditions several years into the latest period of market-oriented reform.	The authors studied the commissioning of services for people with three long term conditions - diabetes, stroke and dementia - in three English primary care trust (PCT) areas over two years (2010-12). They took a broadly ethnographic approach to understanding	Journal article, peer-reviewed research	Multimethod qualitative research

				the day-to-day practice of commissioning.		
Commissioning high-quality care for people with long-term conditions	2013	Smith JA; Shaw S; Porter A; et al	This study explored what commissioners actually do to commission care for people with long-term conditions, and how this might be improved.	The research is based on 15 months of detailed observation from November 2010 to January 2012 in three commissioning communities: Calderdale, Somerset and the Wirral.	Grey literature (Nuffield Trust)	Grey literature (qualitative)
Commissioning in the reformed NHS: policy into practice	2006	Wade, E; Smith, J.A.; Peck, E.; et al	This report focuses on a detailed analysis of what the commissioning function post Commissioning a Patient-Led NHS will actually entail – the tasks and activities that will need to be carried out by PCTs or their agents.	See objectives	University research report	Grey literature (policy paper)
Commissioning NHS dentistry in England: Issues for decision-makers managing the new contract with finite resources	2009	Holmes, R. D.; Bate, A.; Steele, J. G.; et al	To explore the views of dental decision-makers in Primary Care Organisations with regard to the management of NHS dental services, and to gauge participants' awareness of economics-based approaches including programme budgeting and marginal	Recorded semi-structured interviews were conducted with 18 NHS dental decision-makers (mixed clinical and finance backgrounds) predominantly across Primary Care Trusts in England.	Journal article, peer-reviewed research	Qualitative research (interviews)

			analysis, with which to potentially structure commissioning decisions.			
Commissioning of self-management support for people with long-term conditions: an exploration of commissioning aspirations and processes	2016	Reidy C; Kennedy A; Pope C; et al	To explore how self-management support (SMS) is considered and conceptualised by Clinical Commissioning Groups (CCGs) and whether this is reflected in strategic planning and commissioning.	Consisted of a multisite, quasi-ethnographic exploration of 9 CCGs.	Journal article, peer-reviewed research	Qualitative research (ethnography)
Commissioning through Competition and Cooperation: final report	2016	Allen P; Osipovic, D; Shepherd, E; et al	This project aimed to investigate how commissioners in local health systems managed the interplay of competition and cooperation in their local health economies, looking at acute and community health services (CHS).	The project consisted of four in depth case studies of four local health economies located in four CCG areas across England.	Report	Grey literature (case studies)
Cost-effectiveness analysis and formulary decision making in England:	2007	Williams, I; Bryan, S	This paper reports research on the use of economic evaluations in technology coverage decisions in England.	There were two strands to the research. The first involved collation and analysis of information proformas used by decision-making	Journal article, peer-reviewed research	Mixed methods research

Findings from research				committees when considering proposed new technologies—referred to hereafter as New Technology Request Forms (NTRFs). The second strand involved qualitative case studies of decision-making committees.		
Creativity and service innovation: an examination of differences between theory and practice	2016	Gordon, S	This study addresses creativity and innovation literatures and explores the necessity for creativity in the implementation of service innovations in the English National Health Service.	Based on a qualitative research design, and using a critical realist approach, this research unearths a rich seam of empirical data through observations and semi-structured interviews in an English National Health Service primary care organisation, known as a NHS Clinical Commissioning Group	PhD Thesis	PhD thesis
Designing whole-systems commissioning: Lessons from the English experience	2013	Williams, I; Bovaird, T; Brown, H; et al	The primary aims of this study were to identify determinants of successful strategic commissioning and to assess the overall state of current knowledge.	A review of the published literature and interviews with those involved in strategic commissioning in England.	Journal article, peer-reviewed research	Multimethod (literature review and qualitative data)
Determining priorities for	1997	Ruta, D. A.; Duffy, M. C.;	To examine whether information on health and	A three-stage process of information-gathering from	Journal article, peer-	Mixed methods

change in primary care: the value of practice-based needs assessment		Farquharson, A; et al	health care needs, when used as the basis for a priority setting exercise, can provide a useful first step in planning primary care provision within a practice.	a number of sources, including continuous data recording of patient contacts and a postal survey of all adults registered with the practice, identification of key findings and discussion of associated issues, and priority setting of proposals for practice development using the nominal group technique.	reviewed research	research
Developing a prioritisation framework in an English Primary Care Trust	2006	Wilson, E; Rees, J; Fordham, R	The researchers developed a weighted benefit score framework for use in an English PCT which ranked options in order of 'cost-value' or 'cost per point of benefit'.	Development of a weighted benefit score framework for use in an English PCT	Journal article, peer-reviewed research	Feasibility study (development of a tool to help commissioners)
Developing the infrastructure to support the optimisation of antibiotic prescribing using the learning healthcare system to	2020	Palin, V; Tempest, E; Mistry, C; et al	The learning healthcare system (LHS) underpinned by data analysis and feedback to clinical care providers is thought to improve quality of care. This work aimed to implement an LHS for antibiotic prescribing in	Deidentified patient-level data from general practices were processed and analysed at regular intervals (fortnightly increments). A dashboard application was developed and implemented displaying analytical graphics to give	Journal article, peer-reviewed research	Feasibility study (development of a tool to help commissioners)

improve healthcare services in the provision of primary care in England			primary care in England.	periodic feedback to clinicians, tailored to each clinical site. Benchmarking parameters were established by the analysis of two large national primary care datasets allowing peer-to-peer comparisons.		
Does access to a demand-led evidence briefing service improve uptake and use of research evidence by health service commissioners? A controlled before and after study	2017	Wilson, P.M.; Farley, K; Bickerdike, L; et al.	The researchers undertook a controlled before and after study to evaluate whether access to a demand-led evidence briefing service improved the use of research evidence by commissioners compared with less intensive and less targeted alternatives.	Nine Clinical Commissioning Groups (CCGs) in the North of England received one of three interventions: (A) access to an evidence briefing service; (B) contact plus an unsolicited push of non-tailored evidence; or (C) unsolicited push of non-tailored evidence.	Journal article, peer-reviewed research	Controlled before and after study
English national health service's savings plan may have helped reduce the use of three 'low-value' procedures	2015	Coronini-Cronberg, S; Bixby, H; Laverty, A. A.; et al	The National Health Service (NHS) must seek reductions in health expenditures of 17 percent over four years. The spending cuts were to be achieved through improvements in service	To assess whether the initiative had an impact, we examined six low-value procedures: spinal surgery for lower back pain, myringotomy to relieve eardrum pressure, inguinal hernia repair, cataract	Journal article, peer-reviewed research	Evaluation

			quality and efficiency, including reducing the use of ineffective, overused, or inappropriate procedures. However, the NHS left it to the local commissioning (or funding) organizations, known as primary care trusts, to determine what steps to take to reduce spending.	removal, primary hip replacement, and hysterectomy for heavy menstrual bleeding.		
Evaluating the design and implementation of the whole systems integrated care programme in North West London: why commissioning proved (again) to be the weakest link	2019	Smith, J; Wistow, G; Holder, H; et al.	The authors examined the role of commissioning in attempts to secure large-scale change within and between health and social care services to support the delivery of integrated care for people living with complex long-term conditions.	The authors analysed data collected in semi-structured interviews, surveys, workshops and non-participant observations using a thematic framework derived both deductively from the literature on commissioning and integrated care	Journal article, peer-reviewed research	Multimethod qualitative research
Evidence based policy making and the 'art' of commissioning – how English	2015	Wye, L; Brangan, E; Cameron, A; et al	Policymakers such as English healthcare commissioners are encouraged to adopt 'evidence-based policy-	In case studies of four commissioning organisations, we interviewed 52 people including clinical and	Journal article, peer-reviewed research	Qualitative research (case studies)

healthcare commissioners access and use information and academic research in 'real life' decision-making: an empirical qualitative study			making', with 'evidence' defined by researchers as academic research. To learn how academic research can influence policy, researchers need to know more about commissioning, commissioners' information seeking behaviour and the role of research in their decisions.	managerial commissioners, observed 14 commissioning meetings and collected documentation e.g. meeting minutes and reports. Using constant comparison, data were coded, summarised and analysed to facilitate cross case comparison.		
Evidence in management decisions (EMD) _advancing knowledge utilization in healthcare management	2012	Swan, J.; Clarke, A.; Nicolini, D.; et al	To investigate the utilisation of evidence in actual healthcare commissioning decisions	Detailed case studies focusing on commissioning practices in 4 NHS commissioning organisations (PCTs), which were chosen to capture variation in context. A nationally representative survey of individuals involved in commissioning.	NIHR Report	Qualitative research (case studies)
Evidence use in decision-making on introducing innovations: a systematic scoping review with stakeholder	2017	Turner, S.; D'Lima, D.; Hudson, E.; et al.	To understand how decision-making processes at the professional group, organisational, and local system level influence the use of evidence in decisions to adopt	A systematic scoping review was used to review the health literature on innovations within acute and primary care and map processes at the professional, organisational	Journal article, peer-reviewed research	Systematic review

feedback			innovations in acute and primary health care?	and local system levels which influence how evidence informs decision-making on innovation.		
Evidence-based commissioning in the English NHS: who uses which sources of evidence? A survey 2010/2011	2013	Clarke, A.; Taylor-Phillips, S.; Swan, J.; et al	To investigate types of evidence used by healthcare commissioners when making decisions and whether decisions were influenced by commissioners' experience, personal characteristics or role at work.	Cross-sectional survey of 345 National Health Service (NHS) staff members. The study was conducted across 11 English Primary Care Trusts between 2010 and 2011.	Journal article, peer-reviewed research	Survey analysis
Evidence-based policy-making in the NHS: exploring the interface between research and the commissioning process.	1999	Harries, U.; Elliott, H.; Higgins, A.	To identify factors which facilitate or impede evidence-based policy-making at a local level in the NHS.	The study involved a literature review and case studies of social research projects which were initiated by NHS health authority managers or general practitioner (GP) fundholders in one region of the NHS. Data were collected through in-depth interviews with lead policy-makers, GPs and researchers working on each of the case studies and analysis of project	Journal article, peer-reviewed research	Multimethod (literature review and qualitative data)

				documentation.		
Exploring the early workings and impact of emerging Clinical Commissioning Groups: Final report	2012	Checkland, K.; Coleman, A.; McDermott, I.; et al	The aim of the study was to explore the early experiences of emerging Clinical Commissioning Groups as they set themselves up as 'Pathfinders' and moved towards authorisation, investigating the factors that had affected their development and drawing out lessons for the future	Case studies in eight CCGs, along with national web surveys at two points in time and telephone interviews with a random sample of CCGs.	Report (published by the Policy Research Unit in Commissioning and the Healthcare System Manchester Centre for Health Economics)	Grey literature (case studies)
Exploring the GP 'added value' in commissioning: What works, in what circumstances, and how?	2015	Mcdermott, I.; Coleman, A.; Perkins, N.; et al	This report presents the findings from a second phase of our ongoing study following the development of CCGs in England since 2011. The aim of the second phase of our study was therefore to follow up those claims made in the first phase around issues of GP 'added value'. We explored further the potential added value that clinicians, specifically GPs,	Using semi-structured interviews with clinicians and managers, observations of a range of CCG meetings in 4 sites	Report (published by the Policy Research Unit in Commissioning and the Healthcare System Manchester Centre for Health Economics)	Grey literature (multimethod qualitative)

			bring to the commissioning process in interviews, and followed this up with observations of commissioners at work.			
Exploring the ongoing development and impact of Clinical Commissioning Groups	2014	Checkland, K.; Coleman, A.; Perkins, N.; et al	To explore the impacts of CCGs, with a particular focus upon the potential added value that clinicians bring to the commissioning process (in its widest sense), and to elucidate the contexts and factors that enable or inhibit the delivery of these benefits.	The findings presented here represent the second stage of a longitudinal project tracking the development and early activities of CCGs. For this second stage of the research we are tracking the ongoing development of the case study CCGs	Report (published by the Policy Research Unit in Commissioning and the Healthcare System Manchester Centre for Health Economics)	Grey literature (case studies)
Facilitating large-scale implementation of evidence based health care: insider accounts from a co-operative inquiry	2015	Waterman, H.; Boaden, R.; Burey, L.; et al.	To understand how knowledge transfer associates (KTAs) working as part of the UK National Institute for Health Research 'Collaboration for Leadership in Applied Health Research and Care' for Greater Manchester (GM CLAHRC) facilitated	A prospective co-operative inquiry with eight Knowledge Transfer Associates (KTAs) was carried out comprising of 11 regular group meetings where they reflected critically on their experiences. Twenty interviews were also	Journal article, peer-reviewed research	Evaluation

			the implementation of EBHC across several commissioning and provider health care agencies.	conducted with other members of the GM CLAHRC Implementation Team to gain their perspectives of the KTAs facilitation role and process.		
Facing the Future: A Study of the Changing Pattern of Contracting within a National Health Service Community Trust 1994-2001	2002	Cowie, A	This study examines the policy formation processes involved in contracting for community health care services between 1994 and 2001.	Interviews and non-participant observations of key meetings and seminars, supported by documentary evidence from both published material in the public domain and internal documents from stakeholder organisations.	PhD Thesis	PhD thesis
From data to decisions? Exploring how healthcare payers respond to the NHS Atlas of Variation in Healthcare in England	2014	Schang, L.; Morton, A.; DaSilva, P.; et al	To explore to what extent and how Primary Care Trusts (PCTs) in England have used the NHS Atlas of Variation in Healthcare	Data collection involved an email survey among PCT Chief Executives and a telephone follow-up to reach non-respondents (total response: 53 of 151 of PCTs, 35%). 45 senior to mid-level staff were interviewed to probe themes emerging from the survey. The data were analysed using a matrix-based Framework approach.	Journal article, peer-reviewed research	Mixed methods research

GP Champions for Youth Health: Commissioning effective primary care services for young people	N/a	Association for Young People's Health (AYPH), the Royal College of General Practitioners' (RCGP) Adolescent Health Group and Youth Access.	Briefing aimed at policymakers, commissioners and funders, including independent funders with an interest in health and health-related services for young people up to 25 years. Its purpose is to support improvements in young people's access to Primary Care services	Briefing paper bringing together some of the lessons learnt during the GP Champions project. It is intended to help policymakers and commissioners think about steps they can take to secure a better investment in young people's health.	Briefing paper for policymakers	Briefing paper
How are policy makers using evidence? Models of research utilisation and local NHS policy making	2000	Elliott, H.; Popay, J.	To identify factors that facilitate or impede evidence-based policy making at a local level in the UK National Health Service (NHS).	One NHS region in England.	Journal article, peer-reviewed research	Multimethod (literature review and qualitative data)
Implementing world class commissioning competencies	2012	McCafferty, S.; Williams, I.; Hunter, D.; et al	To explore the development and implementation of world class commissioning and draws implications for future commissioning arrangements.	This research draws on interviews with key informants (n = 6) and a literature review to analyse the aims of, and stimulus for, WCC. In-depth interviews (n = 38) were conducted in three PCTs in	Journal article, peer-reviewed research	Multimethod (literature review and qualitative data)

				the north of England in 2009 to analyse the interpretation and implementation of WCC.		
Improving the capabilities of NHS organisations to use evidence: a qualitative study of redesign projects in Clinical Commissioning Groups	2017	Swan, J.; Gkeredakis, E.; Manning, RM.; et al	To understand practices and conditions (which we term 'capabilities') that enable evidence use in commissioning work. We consider how research gets into CCGs ('push'), how CCGs use evidence ('pull') and how this can be supported (toolkit development).	Semistructured ethnographic interviews in eight CCGs. We also conducted observations of redesign meetings in two of the CCGs.	NIHR Report	Grey literature (multimethod qualitative)
Informing Healthier Choices: Information and Intelligence for Healthy Populations	Unknown	Department of Health	Strategy piece - the document sets out proposals to provide comprehensive and innovative information systems that can make a real difference to delivery of these plans in a cost effective fashion. The ultimate aim is health improvement but these proposals would also underpin evidence based commissioning of services,	See objectives	Government report	Grey literature (strategy piece)

			as well as providing more precise and meaningful monitoring of performance of public service activities.			
Introducing care pathway commissioning to primary dental care: measuring performance	2011	Harris, R.; Bridgman, C.; Ahmad, M.; et al	To describe data from a pilot use of a blended contract using key performance indicators related to primary dental care	To report on the findings of a project involving three dental practices implementing a system based on rating patients according to their risk of disease and need for care are outlined by reporting data from surgery-based clinical databases and interviews from commissioners and providers	Journal article, peer-reviewed research	Mixed methods research
Investigating recent developments in the commissioning system	2018	Moran, V.; Allen, P.; McDermott, I.	The questions addressed by the research were: 1. How are CCG internal processes of decision making changing? 2. What is the role of the individual CCG in the current commissioning landscape? 3. How is accountability maintained by CCGs in the current commissioning landscape? 4. How is	The design of the study consisted of three case study sites centred round three CCG areas, spread across England. Our main method of data collection was interviews with senior commissioners in the CCGs and senior managers in a selection of local provider organisations and local authorities. We collected	Report (PRU Comm) by PRU Comm, a collaboration between London School of Hygiene and Tropical Medicine,	Grey literature (case studies)

			competition and the current pricing regime relevant to CCGs' commissioning decisions? 5. How should commissioning develop?	additional data by examining locally produced documents, such as STP plans	the University of Manchester, the Centre for Health Services Studies at the University of Kent and the Personal Social Services Research Unit.	

Investigating the process of community profile compilation	1996	Billings, J.	To provide a critical review of the data collection processes involved in the compilation of a community profile for one area within the context of the NHS reforms	To investigate the data collection processes involved in compiling a community profile to assess family health needs from the perspective of one fund-holding GP.	Journal article, peer-reviewed research	Evaluation
Knowledge exchange in health-care commissioning: case studies of the use of commercial, not-for-profit and public sector agencies, 2011–14	2015	Wye, L; Brangan, E; Cameron, A; et al	To study knowledge exchange between these external providers and health-care commissioners to learn about knowledge acquisition and transformation, the role of external providers and the benefits of contracts between external providers and health-care commissioners.	Using a case study design, we collected data from eight cases, where commercial and not-for-profit organisations were contracted. We conducted 92 interviews with external providers (n = 36), their clients (n = 47) and others (n = 9), observed 25 training events and meetings and collected various documentation including meeting minutes, reports and websites.	NIHR Report	Grey literature (case studies)

Leadership of healthcare commissioning networks in England: a mixed-methods study on clinical commissioning groups	2013	Zachariadis, M; Oborn, E; Barrett, M; et al.	To explore the relational challenges for general practitioner (GP) leaders setting up new network-centric commissioning organisations in the recent health policy reform in England	Mixed-method, multisite and case study research in six clinical commissioning groups and local clusters in the East of England area	Journal article, peer-reviewed research	Qualitative research (case studies)
LSE/ Right Care project on NHS Commissioners' use of the NHS Atlas of Variation in Healthcare: Case studies of local uptake	2012	Schang, L.; Morton, A.	To understand how the Right Care Atlas series is being used within PCT clusters and CCGs to inform planning activities, and identify levers and barriers to use	Case studies of several NHS organisations	Report	Grey literature (case studies)
National evaluation of general practitioner commissioning pilots: lessons for primary care groups	2000	Smith. J; Regen, E; Shapiro, J; et al	To monitor the development of the 40 national pilot sites, identify the factors that inhibited or facilitated progress, and consider the implications for the implementation and development of primary care groups (PCGs).	Semi-structured face-to-face interviews with GPs, health authority (HA) managers, and pilot managers from each of the 40 pilot sites (141 interviews in total) and focus group discussions with nurses, social services officers, and community health council officers in the 40 sites.	Journal article, peer-reviewed research	Multimethod qualitative research

Negotiating commissioning pathways for the successful implementation of innovative health technology in primary care	2019	Maniatopoulos, G.; Haining, S.; Allen, J.	To explore the process by which commissioning organisations make their decisions to commission innovative health technologies.	Case study of four Clinical Commissioning Groups (CCGs) involved in the commissioning of services in primary and secondary care. Semi-structured in-depth interviews (16 in total) and two focus groups	Journal article, peer-reviewed research	Qualitative research (case studies)
NHS commissioning practice and health system governance: a mixed-methods realistic evaluation	2015	Sheaff, R.; Charles, N.; Mahon, A.; et al	To: elicit the programme theory of NHS commissioning policy and empirically test its assumptions; explain what shaped NHS commissioning structures; examine how far current commissioning practice allowed commissioners to exercise governance over providers; examine how commissioning practices differ in different types of commissioning organisation and for specific care groups; and explain what factors influenced commissioning practice and the relationships between	Mixed-methods realistic evaluation with four English case study sites (CCGs)	NIHR publication	Grey literature (case studies)

			commissioners and providers.			
Perceptions of the uses of routine general practice data beyond individual care in England: a qualitative study	2018	Wyatt, D.; Cook, J.; McKevitt, C	To investigate how different lay and professional groups perceive and understand the use of routinely collected general practice patient data for research, public health, service evaluation and commissioning.	Multimethod, qualitative study including participant observation of the design and delivery of a series of deliberative engagement events about a local patient database made of routine primary care data. The researchers also completed semistructured interviews with key professionals involved in the database. The research took place in an inner city borough in England.	Journal article, peer-reviewed research	Multimetho d qualitative research
Power to the people	2009	Shepherd, S.	To describe how shared data is providing a critical tool through which NHS services can improve their understanding of their local populations.	Analysis piece in journal supplement, includes two examples of goof practice of data sharing	Journal supplement	Descriptive piece
Practice makes perfect: “GP-led commissioning will only succeed if the new consortia learn	2010	Corrigan, P	To argue that creating general practitioners (GP) commissioning consortia will only take place if time and effort are given to the development of GPs as	Pamphlet published by a think tank based around a single case study in Cumbria.	Think tank (Demos) publication	Grey literature (think tank piece)

the lessons of NHS Cumbria"			leaders and members of these consortia			
Practice-based Commissioning: Reinvigorate, Replace or Abandon?	2008	Curry, N.; Goodwin, N.; Naylor, C.; et al	To assess the progress made in meeting three objectives (encouraging clinical engagement in service redesign and development, bringing about better, more convenient, services for patients, and enabling the better use of resources) related to Practice Based Commissioning	In-depth interviews conducted with a range of key stakeholders in four PCT sites	Grey literature (King's Fund)	Grey literature (interviews)
Prioritising public health: a qualitative study of decision making to reduce health inequalities	2011	Orton, LC.; Lloyd-Williams, F.; Taylor-Robinson, DC.; et al	To explore the current experiences of those involved in decision making to reduce health inequalities with cardiovascular disease (CVD) as a case study.	In-depth qualitative study employing 40 semi-structured interviews and three focus group discussions. Participants were public health policy makers and planners in CVD in the UK, including: Primary Care Trust and Local Authority staff (in various roles); General Practice commissioners; public health academics; consultant cardiologists; national guideline	Journal article, peer-reviewed research	Multimethod qualitative research

				managers; members of guideline development groups, civil servants; and CVD third sector staff.		
Prioritizing investment in public health and health equity: what can commissioners do?	2013	Marks, L.; Weatherly, H.; Mason, A.	To explore commissioners' views on prioritizing for investment in health	Decision makers' views were sought through semi-structured interviews and an online survey, and prioritization tools were reviewed. Interviews were held in 2008-2009 with a subsample followed up in 2009-2010. In late 2009, a national online survey was sent to 508 individuals across 146 primary care trusts (PCTs).	Journal article, peer-reviewed research	Mixed methods research
Priority Setting among Primary Care Trusts in Northwest England: Approaches, Processes and Use of Evidence	2007	Chinamasa, C.	To explore the approaches, processes and use and presentation of evidence for setting priorities among PCTs within a Strategic Health Authority in the North West of England.	Data were collected using in-depth semi-structured interviews among samples of people involved in setting priorities at PCTs A (9 out of the 11 people identified) and B (13 out of the 25 identified); a self-administered postal questionnaire survey among 85 (out of 170) people involved in Tier 2	Grey literature (PhD thesis)	PhD thesis

				priority setting at 11 (out of 14) PCTs within Greater Manchester and a focus group discussion among members of the Professional Executive Committee (PEC) at PCT C.		
Reconciling putting people first and world class commissioning: A case study	2009	Klee, D.	To describe the challenges faced by a Council and PCT in understanding and agreeing shared priorities and how they used this whole-systems framework to keep a clear focus on what local people want and need	Descriptive piece by author based on their experience	Feature piece in journal	Descriptive piece
Requisite models for strategic commissioning: the example of type 1 diabetes	2008	Airoldi, M.; Bevan, G.; Morton, A.; et al	To develop a framework for cost-effectiveness analysis to provide information for organisations responsible for strategic commissioning of health services for defined populations and illustrates its use by modelling intensive glucose control in type 1 diabetes in England.	This paper outlines a framework that estimates the health benefits and costs of different interventions and shows how this requires modelling to produce estimates in a way that is transparent to commissioners, of requisite complexity to produce sound estimates for priority setting using routinely available data.	Journal article, peer-reviewed research	Framework development

Rhetoric, evidence and policymaking: a case study of priority setting in primary care	2009	Russell, J.; Greenhalgh, T.	To contribute to scholarly inquiry about how policymakers talk about and reason with evidence by exploring the microprocesses of deliberation and specifically the meaning-making practices of a group of people charged with prioritising health care within an NHS Primary Care Trust in the UK.	Case study of a Priorities Forum of an NHS Primary Care Trust (PCT) based on meeting observations and interviews	Final report of a research project	Grey literature (case studies)
Risk or reward? The Changing Role of CCGs in General Practice	2015	Holder, H.; Robertson, R.; Ross, S.; et al	To understand the development of CCGs, and to understand how CCGs are functioning as membership organisations and how they are supporting the development of primary care in their local area.	Report based on a survey, interviews, observations and reviews of board papers	Grey literature (King's Fund)	Grey literature (mixed methods)
Structures and processes for priority-setting by health-care funders: a national survey of primary care	2012	Robinson, S.; Dickinson, H.; Freeman, T.; et al	To undertake a survey of local resource allocators in the English National Health Services in order to map and explore current priority-setting activity.	A national survey was sent to Directors of Commissioning in English Primary Care Trusts (PCTs) and analysed	Journal article, peer-reviewed research	Survey analysis

trusts in England						
The capacity of health service commissioners to use evidence: a case study	2018	Currie, G.; Croft, C.; Chen, Y.; et al	To explore the capacity of CCG-led commissioning networks to make decisions that are based on evidence.	Study of 13 cases of representative (region, size, urban/rural) commissioning networks in England, drawing on interviews with commissioning managers, general practitioners (GPs), patient and public involvement (PPI) representatives and other relevant stakeholders	NIHR Report	Grey literature (interviews)
The effects of an evidence- and theory-informed feedback intervention on opioid prescribing for non-cancer pain in primary care: A controlled interrupted time series analysis	2021	Alderson SL.; Farragher, TM.; Willis, TA.; et al	To evaluate the effects of a comparative feedback intervention with persuasive messaging and action planning on opioid prescribing in primary care.	Interrupted time series analysis	Journal article, peer-reviewed research	Interrupted time series analysis
The impact of a	1999	Evans, D	To report the results of a	A qualitative case-study	Journal	Qualitative

quasi-market on sexually transmitted disease services in the UK			study of the impact of quasi-market reforms on sexually transmitted disease (STD) services in one UK health region	approach to examine HA commissioning of STD services	article, peer-reviewed research	research (case studies)
The impact of the NHS market: An overview of the literature	2010	Brereton, L.; Vasoodaven, V.	To present the results of a literature search on the effectiveness of NHS 'internal' or 'quasi' market policies to promote competition among providers over the past 20 years.	Literature review	Grey literature (think tank report)	Grey literature (think tank piece)
The NHS deserves better use of hospital medicines data	2020	Goldacre B.; MacKenna, B.	To argue that that hospital medicines data has huge potential to improve patient care and that its use for public good is being blocked by cultural, contractual, and political barriers, rather than technical complexity	N/a - analysis piece	Journal article, peer-reviewed research	Opinion piece
The Use of External Consultants by NHS Commissioners in England: What Lessons Can Be	2011	Naylor, C.; Goodwin, N.	To describe the current use of external support by commissioners in the English NHS, assess what impact it is having; explore the factors influencing effectiveness and draw out	Two national surveys of primary care trust managers, qualitative interviews and focus groups with representatives of 12 firms providing support services to commissioners,	Journal article, peer-reviewed research	Mixed methods research

Drawn for GP Commissioning?			the implications for the future of NHS commissioning.	focus groups in three primary care trusts and interviews with representatives of two strategic health authorities (SHAs).		
The work of commissioning: a multisite case study of healthcare commissioning in England's NHS	2013	Shaw, S.; Smith, JA.; Porter, A.; et al	To examine the work of commissioning care for people with long-term conditions and the factors inhibiting or facilitating commissioners making service change.	Multisite mixed methods case study research, combining qualitative analysis of interviews, documents and observation of meetings across three 'commissioning communities' (areas covered by a primary care trust) in England	Journal article, peer-reviewed research	Mixed methods research
Together we are better? Strategic needs assessment as a tool to improve joint working in England	2011	Ellins, J.; Glasby, J.	To report the results of a national survey to explore preparations under way by local authorities and primary care trusts (PCT) for the duty to conduct a joint strategic needs assessment (JSNA), key barriers and enablers to this, and the implications for future policy	The researchers conducted a national survey of all PCT chief executives, directors of adult social services and public health in England (a total of 459 people). A qualitative survey was e-mailed in February 2008 at the time when health and social care communities were preparing to implement the new duty. All completed surveys were	Journal article, peer-reviewed research	Survey analysis

				analysed by both authors using thematic content analysis.		
Towards equitable commissioning for our multiethnic society: a mixed-methods qualitative investigation of evidence utilisation by strategic commissioners and public health managers	2013	Salway, S.; Turner, D.; Mir, G.; et al	To describe, across a range of commissioning contexts, how managers seek out, appraise and apply evidence relating to ethnic diversity and inequality alongside other forms of knowledge, and to identify factors (at evidence, individual and contextual levels and their interfaces) that support or inhibit the critical and effective use of evidence within the commissioning cycle and thereby identify promising routes of intervention.	In-depth semistructured interviews were conducted with 19 national key informants. Detailed case studies of real-world commissioning work were undertaken focused on three primary care trusts and their partner organisations.	NIHR publication	Grey literature (case studies)
Uncovering the processes of knowledge transformation: the example of local evidence-informed policy-making in United	2020	Gabbay, J.; le May, A.; Pope, C.; et al	To understand how and why healthcare policy-makers transform research-based evidence into the knowledge they ultimately use.	Interviews, meeting observations and document reviews in four healthcare-commissioning organisations working with external agencies	Journal article, peer-reviewed research	Qualitative research (multimethod)

Kingdom healthcare						
Understanding primary care co-commissioning: Uptake, development, and impacts. Final report	2018	McDermott, I.; Warwick-Giles, L.; Gore, O.; et al	To understand the scope of co-commissioning activity and the process of change, the practice of co-commissioning, to understand how does co-commissioning affect the external relationships of the CCG, what (if any) new or altered services have been established as a result of co-commissioning, and what factors facilitated or inhibited the development of new services or the improvement in existing services	Interviews with senior policy makers, review of documents, telephone surveys and case studies	Report (PRU Comm) by PRU Comm, a collaboration between London School of Hygiene and Tropical Medicine, the University of Manchester, the Centre for Health Services Studies at the University of Kent and the Personal Social Services Research	Grey literature (mixed methods)

					Unit.	
Understanding the new commissioning system in England: contexts, mechanisms and outcomes	2018	Checkland, K.; Hammond, J.; Sutton, M.; et al	To assess the impact of the reforms on the operation and outcomes of the commissioning system.	Analysis of publicly available policy documents, case studies of two local areas of England including interviews, quantitative analysis of relevant outcomes	This report is based on independent research commissioned and funded by the NIHR Policy Research Programme 'Understanding the new commissioning system in England: contexts, mechanisms and outcomes' PR-R6-1113-25001	Grey literature (mixed methods)
Uptake of NHS health check: issues in monitoring	2018	Riley, V.; Gidlow, C.; Ellis, N.	To explore the perceptions of those involved in commissioning of NHSHC to better understand the implications for local and national monitoring and	Interviews with NHSHC commissioners and leads	Journal article, peer-reviewed research	Qualitative research (interviews)

			evaluation of programme uptake.			
Using clinical practice variations as a method for commissioners and clinicians to identify and prioritise opportunities for disinvestment in health care: a cross-sectional study, systematic reviews and qualitative study	2015	Hollingworth, W.; Rooshenas, L.; Busby, J.; et al	To explore if geographical variation in procedure rates is a marker of clinical uncertainty and might be used by local commissioners to identify procedures that are potential candidates for disinvestment.	Analysis of Hospital Episode Statistics to measure geographical variation in procedure rates, rapid systematic reviews of two high-use procedures selected by the PCTs, non-participant overt observations of commissioning meetings and semistructured interviews with stakeholders about disinvestment in general and with clinicians and patients about one disinvestment case study	NIHR report	Grey literature (mixed methods)
Using RightCare to engage general practice nurses in Liverpool	2017	Poll, S.; Lloyd, K	To describe an approach used by Liverpool Clinical Commissioning Group. The CCG is using the RightCare approach to engage nurses working in its 92 GP practices, prompting them to discuss what can be done to improve care and reduce variation	Description of a case study	Journal article, peer-reviewed research	Descriptive piece

Using routine data to conduct small area health needs assessment through observing trends in demographics, recording of common mental health problems (CMHPs) and sickness certificates: longitudinal analysis of a northern and London locality	2010	Chan, T.; Cohen, A.; de Lusignan, S.	To examine the trends in common mental health problems (CMHPs), prescription of antidepressant, anxiolytics and hypnotics and medical certificates over four years to highlight the strengths and pitfalls in trends analysis using primary care data.	Relevant clinical information for the first six months of each of the calendar years 2004, 2005, 2006 and 2007 were extracted from participating practices in a London locality and in the North	Journal article, peer-reviewed research	Longitudinal study
Using routinely gathered data to empower locally led health improvements	2013	Dhillon, A.; Godfrey, AR.	The authors suggest that routinely gathered data should also be used to help clusters of practices to learn from locally led innovation and to motivate long-term partnerships for interorganisational health improvement. The authors describe some of the existing data sources that	The authors have roles as GPs, Health Network members and Clinical Commissioning Group leaders. In this article they describe how, in their opinions, routinely gathered data to empower locally led health improvements	Journal article, peer-reviewed research	Descriptive piece

			could be used to do this as well as some of the dangers of using data in this way			
Using routinely gathered data to evaluate locally led service improvements	2011	Stoddart, G.; Gale, R.; Peat, C.; et al	To describe a test done by NHS Ealing, whereby they tested the feasibility of a) combining data from more than one data-domain at the same time to quantify patient movement across the primary care/acute hospital boundary, and b) establishing online analyses so they can be constantly updated with near real-time data to compare different subsets of patients. In addition, to describe how the reports gave the teams leading the projects confidence in the projects and helped to influence local policy.	Description of an intervention run in the NHS in Ealing	Journal article, peer-reviewed research	Descriptive piece
Views of NHS commissioners on commissioning support	2014	Petsoulas, C.; Allen, P.; Checkland, K.; et al	To explore the attitudes of CCGs towards outsourcing commissioning support functions during the initial stage of the CCG reform	Case study research design in eight CCGs, conducting in-depth interviews, observation of meetings and analysis of policy	Journal article, peer-reviewed research	Qualitative research (case studies)

provision. Evidence from a qualitative study examining the early development of clinical commissioning groups in England				documents.		
We can't get anything done because...': making sense of 'barriers' to Practice-based Commissioning	2009	Checkland, K.; Coleman, A.; Harrison, S.; et al	To investigate the issues raised by participants as 'barriers' to the development of Practice-based Commissioning (PBC) in 'early adopter' sites in England.	Case studies of five PBC consortia in three Primary Care Trusts (PCTs). Data collection included interviews, observation of meetings, and analysis of documents tabled at meetings and circulated at other times.	Journal article, peer-reviewed research	Qualitative research (case studies)
What antimicrobial stewardship strategies do NHS commissioning organizations implement in primary care in England?	2020	Allison, R.; Lecky, DM.; Beech, E.; et al	To explore the adoption and use of education/training and supporting AMS resources within NHS primary care in England.	Analysis of questionnaires sent to the medicines management teams of all 209 Clinical Commissioning Groups (CCGs) in England	Journal article, peer-reviewed research	Survey analysis

What do external consultants from private and not-for-profit companies offer healthcare commissioners? A qualitative study of knowledge exchange	2015	Wye, L.; Brangan, E.; Cameron, A.; et al	To learn about the support offered to healthcare commissioners, how external consultants and their clients work together and the perceived impact on the quality of commissioning.	Mixed methods case study of eight cases across NHS commissioning organisations and private and not-for-profit providers, including interview, observation of training events and meetings, as well as document analysis	Journal article, peer-reviewed research	Qualitative research (case studies)
What happens when GPs engage in commissioning? Two decades of experience in the English NHS	2016	Miller, R.; Peckham, S.; Coleman, A.; et al	To review the evidence on commissioning schemes involving clinicians in the United Kingdom National Health Service, between 1991 and 2010	Secondary research - review of published evidence	Journal article, peer-reviewed research	Literature review
Where next for commissioning in the English NHS?	2010	Smith, J.; Curry, N.; Mays, N.; et al	To example the development of NHS commissioning and set out practical suggestions for how it might be strengthened to secure more effective and efficient care.	Secondary research - literature review	Grey literature (published jointly by The Nuffield Trust and The King's Fund)	Grey literature (literature review)

4.1.2 CMO matrix

As outlined in chapter 3, the CMOs across all the evidence sources (synthesis, interviews, meetings) are presented below in a CMO matrix (table 9) using the following key (table 8), allowing for a succinct comparison of the CMOs across evidence sources.

Table 10 key for CMO matrix

✓	Evidence for CMO
=	Convergence (same finding)
+	Complementarity (similar finding)
≠	Dissonance (contradictory finding)
0	Silence (finding not present)

I formed 37 CMOs (table 9) across the three evidence sources. The evidence for 30 CMOs is from the synthesis, i.e. evidence for 30 CMOs was initially found in the realist synthesis (the first type of evidence gathered). Six new CMOs were discovered in the interview evidence, denoted by a tick in the interview column, and one new CMO was discovered in the meeting evidence. A further visualisation and analysis of which CMOs were present in which evidence sources is included in section 4.1.5.

Table 11 CMO matrix

CMO	Synthesis	Interviews	Meetings
CMO 1	✓	+	0
CMO 2	✓	=	0
CMO 3	✓	=	+
CMO 4	✓	=	=
CMO 5	✓	0	0
CMO 6	0	✓	0
CMO 7	✓	+	+
CMO 8	✓	0	0
CMO 9	✓	=	=
CMO 10	✓	+	+
CMO 11	✓	=	=
CMO 12	✓	+	=
CMO 13	✓	=	+
CMO 14	✓	+	0
CMO 15	✓	+	=
CMO 16	✓	+	=
CMO 17	✓	=	0
CMO 18	✓	=	0

CMO 19	✓	=	=
CMO 20	✓	=	+
CMO 21	✓	+	+
CMO 22	✓	+	0
CMO 23	✓	=	=
CMO 24	✓	=	=
CMO 25	✓	+	0
CMO 26	✓	=	0
CMO 27	✓	=	+
CMO 28	0	✓	0
CMO 29	0	✓	0
CMO 30	0	✓	0
CMO 31	0	✓	0
CMO 32	0	0	✓
CMO 33	✓	+	0
CMO 34	✓	=	0
CMO 35	✓	=	0
CMO 36	✓	=	0
CMO 37	0	✓	0

4.1.3 Overarching conceptual categories

Across the three evidence sources, four conceptual categories emerged, into which the CMOs have been grouped:

- Steps of the commissioning cycle
- Characteristics of data
- Commissioners' capabilities, roles, perceptions, and intentions
- Commissioners' relationships with external providers

These categories are further elaborated on in section 4.2. before the respective CMOs.

4.1.4 Substantive theories

As previously outlined, the development of CMOs was facilitated and influenced by substantive theories identified via five methods:

- The papers included in the realist synthesis
- Theories from the broader 'realist literature'
- Substantive theories from adjacent fields identified using the 'ladder of abstraction'
- Ongoing recommendations from my supervisors when reviewing my written work
- Interviews

Table 10 shows which CMOs have been informed by substantive theories and which of the five methods were used to locate them. Some substantive theories are listed as recommended both by my supervisors and found in the 'realist literature,' since they were located via both these methods. Some of the theories are more 'traditional' substantive theories, namely a theory from a specific domain such as economics or psychology. Others draw on broader concepts or models from the academic

literature that can contribute to one aim of substantive theory, which is giving the realist evaluation clues on how mechanisms work.[189]

Table 12 Overview of substantive theories used to inform CMO development

CMO	Name of substantive theory	Notes	Source
CMO 1	Counting or quantification (Deborah Stone)	CMO 1 was informed by the concepts related to 'counting' or quantification or policy issues as outlined by Deborah Stone in her work 'The Policy Paradox' Whi	Study included in the realist synthesis (*Rhetoric, evidence and policymaking: a case study of priority setting in primary care*)
CMO 2	Merton's reference group theory		Realist literature[100] and recommendations from supervisors
CMO 7	Mixed methods research	CMO 7 was informed by the framework of mixed methods research and the mechanisms it purports to activate, e.g. increased validity, deeper understanding of data, etc.	Substantive theories from adjacent fields identified using the 'ladder of abstraction'

CMO 12	Theory of interoperability		Substantive theories from adjacent fields identified using the ‘ladder of abstraction’
CMO 24	Ackoff's theory of the data-information-knowledge-wisdom (DIKW)		Substantive theories from adjacent fields identified using the ‘ladder of abstraction’
CMO 25	Data champion	A data champion is a concept used to develop the CMO	Interviews
CMO 27	Political model of research utilisation (Weiss)		Study included in the realist synthesis (*How are policy makers using evidence? Models of research utilisation and local NHS policy making*)
CMO 34	Theory of coproduction		Study included in the realist synthesis (*Evidence in Management Decisions (EMD) - Advancing Knowledge Utilization in*

			Healthcare Management)
CMO 36	Principal-agent problem		Substantive theories from adjacent fields identified using the ‘ladder of abstraction’

The way in which CMOs have been influenced and enhanced by substantive theories is described in the individual CMO narratives.

4.1.5 Presentation of CMOs

Under each CMO conceptual heading, each CMO is presented under an individual subheading. This begins with a table containing the CMO across all three evidence sources (synthesis, interviews, meetings). The first CMO is presented without any typographical emphasis (bold, italics, underline, etc.). The following typological emphases are used to compare the findings from the other evidence sources:

- Subsequent CMOs without any typographical emphases indicate convergence of findings
- Bold text indicates a new finding
- Italics indicate a complementary finding
- Underlined text indicates a disagreement or dissonance
- Crossed-out text indicates information that is missing (note: where complementary findings are present, italics are used in place of crossed-out text, since the findings are similar or complementary i.e. similar)
- Where there is no data at all in one of the three evidence sources to support a CMO, this is mentioned as ‘silence’

This is followed by a narrative describing the evidence to support the CMO. Selected supporting quotes are presented throughout the CMO narratives: a quote ending with a superscript number stems from a study in the synthesis, where the

corresponding study can be found in the bibliography. Quotes from the interviews and meetings have, as noted in chapter 3, the following superscript indicators: CI plus number, e.g. ^{CI7} to denote commissioner interview 7, EI plus number, e.g. ^{EI2} to denote expert interview 2, PPII plus number, e.g. ^{PPI3} to denote PPI interview 3, and M plus number to denote meeting citations, e.g. ^{M8} for meeting 8. For all quotes, italics denote direct speech. Emphases (in bold) are my own.

4.1.6 Analysis of findings across evidence sources

Following the presentation of the CMOs, I summarise the CMOs across the evidence sources, and hypothesise why there are discrepancies/dissonance, silence, or complementarity of findings occurred.

4.1.7 Final programme theory

The end of this chapter contains the overarching programme theory across all the conceptual categories, shows how the incomplete CMO configurations (the initial programme theory) link to this.

4.2: all CMOs

4.2.1 Conceptual category: steps of the commissioning cycle

Commissioners' usage of data was sometimes related to specific commissioning activities or steps of the commissioning cycle. Data were used both as a source of evidence to inform commissioning decisions, as well as a tool used by commissioners to stimulate improvements.

4.2.1.1 CMO 1: identifying commissioning priorities

Table 13 CMO 1

CMO across evidence sources: Synthesis: When commissioners wish to use an 'objective' source of evidence to identify commissioning priorities (C) commissioners will be inclined to use data (O) because commissioners view data as a neutral and impartial source of evidence (M) Interviews: *If commissioners want to identify commissioning priorities (C) they may consult data as a starting point (O) since they believe they are useful (M)* Meetings: Silence (CMO not present)

Commissioners considered data to be a credible source of evidence for prioritisation, potentially because they perceived them as the source of evidence that could provide the most 'objective' guidance. A commissioner describes the process of looking at data for prioritisation as follows:

> *'We are taking a data driven approach in the strategy refresh. In the first stage we took an objective look at the data. Based upon the data we then did further*

analysis on the big issues that emerged, to determine a prioritised issue short list.'[190]

In one study, the authors discussed their observations of a PCT Priorities Forum, wherein policy issues were 'framed by the numbers' with a public health specialist providing an overview of a problem to be discussed and providing research evidence.[7] The authors describe how data is used:

> 'A striking characteristic of the background papers and oral summary is the way in which policy problems are constructed in terms of quantitative information, with an emphasis on numerical patterns, quantities, and levels. The starting point for exploring a particular policy problem is typically 'looking at the data'…The following extract, reported in full to convey this emphasis on numerical information, is taken from the author's summary of the background paper, introducing the item to the Priorities Forum: "*So what we did was, was to go back and have a look at the data. And basically, what we did, was to run off – erm, the information, is now stored on our Information Systems.*"'[7]

In their study, the authors draw on the work of Deborah Stone, who has argued that numbers have obtained a pre-eminent status in policy making, since they carry 'an aura of credibility' and presumed neutrality.[191,192] In line with this, the authors of a study on the design of a weighted benefit score framework for use in an English PCT described that such a tool would allow a 'rational' decision to be made about what to prioritise, and that such a structured tool can provide an essential 'rational' starting point for discussions, although this rationality is bound within the data available.[193]

Several studies described commissioners using data to identify commissioning priorities using two methods: identifying areas of high cost/spend, or potential areas for health improvement. For example, the study looking at the weighted benefit score framework found that commissioners used a weighted benefit score framework in a PCT which ranked options in order of 'cost-value' or 'cost per point of benefit'[193] or looked at potential 'trim points' (the point at which additional costs per day are incurred if a patient exceeds the average anticipated stay for a particular condition or procedure).[7] Commissioners used data for prioritisation by identifying where health outcomes were worse compared to other areas, or where there were outliers in terms of health outcomes within their commissioning area. For example, commissioners used the Atlas of Variation, which allows them to benchmark against other organisations[9] as well as identify outliers.[48] In another study, commissioners used GP QOF figures to rank GP practices' performance, as well as Hospital Episode Statistics (HES) data to understand prevalence and activity (e.g. in terms of hospital referrals) related to diabetes.[190]

There was evidence in two interviews to support a similar CMO. Interviewees described using data to identify commissioning priorities, although in both cases they stressed that data could only provide a 'starting point' to indicate priorities, and that commissioners would need to complete additional analysis to develop commissioning plans, suggesting they might consider data more useful than 'objective.' One commissioner described using RightCare data to identify areas for further investigation:

> *'So we know what areas for example we're an outlier in in terms of usage and in terms of cost and those things. What we found with that kind of data is, it doesn't necessarily tell you where you could make, it tells you the areas to look at but you usually need to do a bit more digging to understand what it is that the data is telling you'.* [CI15] **(Commissioner interview 15, Manager)**

However, one interviewee[CI16] specifically stated that data did *not* drive the prioritisation of commissioning decisions, and that they didn't have processes in place to first look at data and then decide what priorities could be, providing an example of a Locally Commissioned Service (LCS) that was commissioned based on feedback rather than data. This suggests that commissioners, at least in certain organisations, may have some leeway to decide if they wish to use data for this purpose.

4.2.1.2 CMO 2: monitoring and evaluation (peer review)

Table 14 CMO 2

The same evidence for this CMO was found in the synthesis and interviews: commissioners shared data with clinicians so they could review their performance

CMO across evidence sources:

Synthesis

When commissioners believe that clinicians will act to improve when comparative data are shared and scrutinised by peers (C) they will give them data so they can review and compare their performance relative to their peers (O) because they believe improvements will occur when; there is peer pressure and orientation to a reference group (M); competition (M) and; clinicians are more receptive to feedback from their peers (M)

Interviews

When commissioners believe that clinicians will act to improve when comparative data are shared and scrutinised by peers (C) they will give them data so they can review and compare their performance relative to their peers (O) because they believe improvements will occur when; there is peer pressure and orientation to a reference group (M); competition (M) and; clinicians are more receptive to feedback from their peers (M)

Meetings:

Silence (CMO not present)

relative to their peers. This took several forms, e.g. distributing comparative data on referral rates and prescribing costs using newsletters, sharing 'named information' by practice for peer review, a locally agreed incentive scheme requiring GPs to log their referrals at source and use this data to compare their performance with that of

practice colleagues, distributing comparative data on referral rates and prescribing costs to member practices with formal structures in place to facilitate peer-to-peer conversations, variation data on differences in care processes across PCTs, and 'charts up on the wall' to show a GP with very high prescribing expenditure where he was compared to his peers.[20,48,128,131,194,195] Interviewees shared further examples, including sharing data on flu vaccine uptake with GPs using weekly dashboards so they could compare their progress,[CI16] and local dashboards showing A&E attendances by practice proportionally to the local average, with the hope of driving improvement as practices didn't want to be outliers.[CI21]

Commissioners felt that clinicians were more receptive to peer feedback and review than being 'performance managed' by commissioners. Several studies mentioned that peer review from other clinicians was more likely to effect change compared to being 'performance managed' by commissioning staff without a clinical background.[128,131,194] The interviewees confirmed that they intended to provide quality control and education rather than performance management, and that 'clinician-to-clinician discussions' were more productive than those led by managers.[CI19]

A mechanism that could be activated was peer pressure and orientation to reference group – this CMO has been informed by substantive theory on 'reference groups', which states that a reference group can serve as a group in which individuals are motivated to gain or maintain acceptance.[196] Individuals are observed and evaluated by other members of the reference group, which has the power to award recognition to an individual or withhold it.[196] Clinicians appeared to be aware that they were

being evaluated, and did not want to be perceived as poor performers by their peers: using data for peer review led to improvements by appealing to clinicians' sense of accountability ('*there's something about looking your peers in the face and discussing difficult things*'),[194] competition,[132,197] not wanting to be seen as a low performer ('no one wants to be an outlier'[197]) and perceived peer pressure.[128,197-199] Interviewees confirmed this with similar statements, arguing that people wanted to be better or at least the same as their peers,[EI6] clinicians didn't want to be outliers[CI21] or 'at the bottom'[CI16] and that competition meant people wanted to 'be the best.'[PPII1] This peer review was sometimes linked to financial incentives, e.g. whereby poor performance by one GP practice could limit the income of another[198] or where no GP practice in a group would receive money unless a prescribing target was met.[PPII1]

In addition, the mechanism of learning could be triggered, enabling clinicians to learn that they were performing below a certain standard, thereby prompting them to make improvements. The aforementioned theory of reference group states that reference groups serve as a reference point for people to evaluate themselves, as well as a standard or checkpoint which a person uses to make judgements.[196] Clinicians realised they were not performing as well as their peers after receiving data, encouraging them to make improvements.[132] In other cases, the data sharing on performance relative to peers was linked to improvement schemes such as encouraging GPs to share best practice[CI15] or 'twinning' low referring and high referring practices to encourage learning.[CI10]

4.2.1.3 CMO 3: monitoring and evaluation (sharing data to stimulate improvements)

Table 15 CMO 3

CMO across evidence sources:

Synthesis:

If commissioners believe that clinicians or service providers are not aware their performance is below average (C) and they do not want to be perceived as 'judgemental' or 'performance managing' they may share data with them in the hope of stimulating improvements (O) because of a perception that sharing data can empower clinicians or service providers to come up with solutions (M)

Interviews:

If commissioners believe that clinicians or service providers are not aware their performance is below average (C) and they do not want to be perceived as 'judgemental' or 'performance managing' they may share data with them in the hope of stimulating improvements (O) because of a perception that sharing data can empower clinicians or service providers to come up with solutions (M)

Meetings

If commissioners believe that clinicians or service providers are not aware their performance is below average (C) they may share data with them in the hope of stimulating improvements (O) *based on the assumption sharing this data may trigger discomfort, pressure, and awareness and therefore improvements (M)*

The findings were this CMO were similar across all three evidence sources. In the synthesis, data were sometimes used as a tool to stimulate improvements among clinicians or service providers in a context where commissioners believed clinicians and service providers were not aware of their below average performance.[131,197] Sharing data in an empowering and non-judgemental manner and letting clinicians and service providers come up with their own solutions for improvement was perceived to be effective,[131,200] as described in an NIHR funded study that included interviews with commissioners who had experience of working with GPs:

> ***'If there's a really good arguments, if you can see the graphs, see the numbers people will almost change overnight because they generally want to do the right thing'*** (Patrick, GP commissioner). One chairperson from another CCG recounted that ***'one of the powerful phrases' he had heard from a GP was 'show me the data and I'll sort myself out.'***[131]
>
> *'So a lot of the time people just don't know that the way they're behaving clinically is at variance with their colleagues. They may not know that they ask for 50% more ultrasound scans than anybody else...**So it's not necessarily being done in a judgemental way; it's being done in a sort of actually just to inform you and see if you can solve the problem yourself'.*** Tom, CCG chairperson[131]

Commissioners sharing data led to clinicians and service providers reviewing services and developing improvements, e.g. GPs reviewing referrals after data showed referrals were out of line with local, regional and national patterns,[201] sharing

GP performance data on referrals, thereby making them more aware of their performance as well as the cost implications of this, leading to an increased willingness to change,[128] and sharing of variation data from the RightCare programme among nurses working in general practice to prompt discussions and learning about improvement opportunities.[200]

The interviewees corroborated these findings,[EI3, CI4-6,13-18]providing further examples of sharing data with clinicians to 'start conversations' but letting them draw their own conclusions or find their own solutions:

> *'We've actually said to our, our practices and our PCNs, "Here's the data, this is, what do you wanna do about it? It's up to you, what do you want to do about it"*[CI13] **(Commissioner interview 13, Chair, clinical commissioner (GP))**

> *'One of the things we did…is saying to the practices, "We will let you create your own service to target individual patient groups providing these underlying principles are met." So rather than us inflicting something on them, they'll have the opportunity to highlight a key cohort of patients that they think they can impact and then using the support and the data we give them, give them access to and their own data we then work with them to identify that so that's the way it has worked."*[CI17] **(Commissioner Interview 17, Commissioning Manager)**

Interviewees also stressed that they did not want to be seen as 'performance managing,' showing judgement, or shaming:[CI6,13,15,16,18]

'Yeah, don't RAG (Red, Amber, Green) it. That's my learning point and I think being really clear that it's around quality and education and that, you know, it's a start of a conversation, it's not a judgement on whether something's right or wrong and I think that has made a big difference for us.'[CI18] **(Commissioner Interview 18, Estates (Primary Care), Deputy Director)**

Evidence from the meetings was used to form a similar CMO.[M7-10] A slight difference to the synthesis was that commissioners aimed to elicit feelings of discomfort and pressure in addition to awareness by sharing data. For example, commissioners mentioned sharing prescribing data with high prescribers to stimulate change:

'The four highest prescribers are in [area]…that's some of the highest prescribers are in [area] so something that they need to be repeatedly nudged on.' **(Commissioner 8-A, Meeting 8, agenda item: antibiotic prescribing)**

….

'I think sharing the data with them and even if it's on a one-to-one basis I think that was the most powerful thing before yeah so I think I think it can sometimes the messages can sometimes get lost in all the messages that are out there so I think actually having very specific data around very specific practices whilst it's not comfortable I think absolutely does it does get action.' **(Commissioner 8-B, Meeting 8, agenda item: antibiotic prescribing)**' [ME8]

One commissioner discussed sharing and discussing prescribing data at Prescribing Leads and practice meetings.[M7] Another commissioner suggested that prescribing data might be shared with the Associate Directors at practice meetings, which was

deemed preferable to writing letters.[M10] In one meeting, commissioners reviewed a primary care scorecard showing how individual GP practices were ranked in [area] against a range of criteria such as MMR and flu vaccines administered. One commissioner described a GP practice that improved their performance after having this data presented to them in the form of a 'primary care scorecard', since the data appeared to raise awareness of their performance, which they felt was not good enough for their patients:

> *'I'd like to highlight the [name] practice to you who are now ranked first in [area] for these indicators on this scorecard. When we first published this scorecard a year ago, they were ranked 15th, and their really weak areas were around five-year childhood vaccines, around MMR first and second doses…**They're now at 100% in those areas and that was due to us presenting back already very easily available data to them in this format.** I had a lot of questions from [name], a lot of questions and comments from his practice manager, and they really embraced this and said, you know, this isn't good enough for patients registered at this practice, we want to do better, and they've clearly turned it around…I'm not worried about them doing well at that inspection, but I want to hear about how they managed to move their MMR vaccines from 50 to 100% in one of the most deprived areas of [area] with a population that they'd historically struggled with. **Because that's this message that we need to be sharing throughout the system and with other practices. And you know and that was just the power of presenting about the data to them…' (*Commissioner 9-A, Meeting 9)**[M9]

Appendix Three: Primary Care Scorecard

		IMD - Index of Multiple Deprivation	GP Survey - Overall experience	GP Survey - Making an appointment	COPD - % confirmed by spirometry	AF - % eligible treated with anticoagulation	BP - % 45+ with record of BP in last 5 yrs	Diab T1 – all 8 care processes	Diab T2 – all 8 care processes	MH - % comprehensive care plan	Dementia - face-to-face review	Ch Imms - % aged 1 DTaP/IPV/Hib/HepB	Ch Imms - % aged 2 PCV Booster	Ch Imms - % aged 2 Hib/MenC	Ch Imms - % aged 2 MMR	Ch Imms - % aged 5 DTaP/IPV/Hib	
		T 33%	T 33%	T 33%	T 33%	T 33%	T 33%	T 33%	T 33%	T 33%	T 33%	95.0%	95.0%	95.0%	95.0%	95.0%	
		2019	Jul-21	Jul-21	Jul-21	Jul-21	Jul-21	Sep-20	Sep-20	Jul-21	Jul-21	Q4 20/21	Q4 20/21	Q4 20/21	Q4 20/21	Q4 20/21	C
CENTRAL	P85608 - PERKINS PRACTICE	50.42	91.2%	74.1%	93.0%	97.1%	92.5%	50.0%	12.8%	35.7%	75.0%	85.7%	100.0%	100.0%	100.0%	100.0%	
WEST	P85010 - WOODLANDS MEDICAL PRACTICE	25.10	87.8%	66.9%	90.1%	94.4%	88.8%	22.2%	27.6%	62.6%	38.6%	93.5%	100.0%	100.0%	100.0%	100.0%	
EAST	P85005 - LEESBROOK SURGERY	18.10	94.0%	84.7%	84.7%	89.3%	89.4%	25.0%	27.6%	32.4%	7.6%	100.0%	100.0%	100.0%	100.0%	100.0%	
NORTH	P85614 - VILLAGE MEDICAL PRACTICE	26.72	76.6%	66.6%	82.7%	90.7%	91.3%	50.0%	27.3%	80.6%	52.6%	90.0%	100.0%	100.0%	100.0%	100.0%	
EAST	P89006 - PENNINE MEDICAL CENTRE	18.42	91.6%	87.6%	75.2%	92.8%	89.7%	11.1%	20.2%	93.0%	72.0%	100.0%	93.1%	93.1%	93.1%	100.0%	
CENTRAL	Y01124 - THE DURU PRACTICE	46.49	91.0%	75.1%	97.6%	96.0%	93.3%	33.3%	10.0%	42.3%	30.0%	83.3%	91.7%	91.7%	91.7%	100.0%	
EAST	P85602 - SARAF MEDICAL PRACTICE	28.18	84.4%	83.6%	100.0%	93.5%	91.3%	100.0%	16.7%	14.3%	12.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
CENTRAL	P85002 - ST MARY'S MEDICAL CENTRE	48.26	89.8%	92.9%	89.4%	87.2%	88.1%	25.0%	30.2%	31.6%	11.1%	88.24%	100.0%	100.0%	100.0%	100.0%	
WEST	P85605 - LITTLETOWN FAMILY MED PRACTICE	42.58	80.2%	75.2%	93.3%	97.4%	88.8%	50.0%	29.1%	56.3%	85.7%	100.0%	100.0%	100.0%	100.0%	100.0%	
EAST	P85016 - SADDLEWORTH MEDICAL PRACTICE	9.64	80.3%	57.1%	91.4%	90.8%	84.6%	16.7%	26.4%	6.0%	43.2%	100.0%	100.0%	100.0%	100.0%	100.0%	
WEST	P85004 - CHADDERTON MEDICAL PRACTICE	34.57	98.4%	93.6%	78.9%	98.2%	91.6%	0.0%	15.1%	13.5%	17.6%	88.2%	92.3%	100.0%	92.3%	100.0%	
WEST	P85615 - KAPUR FAMILY CARE	44.83	59.3%	41.8%	89.9%	93.8%	91.0%	33.3%	20.0%	54.6%	46.9%	89.7%	89.8%	91.8%	91.8%	100.0%	
WEST	P85011 - CH MEDICAL PRACTICE	32.86	86.0%	77.7%	77.2%	88.1%	87.5%	16.7%	12.2%	25.5%	9.6%	91.3%	100.0%	100.0%	100.0%	100.0%	

4.2.1.4 CMO 4: monitoring and evaluation (supporting outliers)

Table 16 CMO 4

CMO across evidence sources:

Synthesis:

Where data indicate potential for improvement, and commissioners suspect that clinicians need help to achieve improvements (C) and commissioners want to be seen as supportive rather than judging (C) commissioners may offer support to outliers and underperformers (O) because they want to maintain good relationships by being perceived as supportive (M)

Interviews:

Where data indicate potential for improvement, and commissioners suspect that clinicians need help to achieve improvements (C) and commissioners want to be seen as supportive rather than judging (C) commissioners may offer support to outliers and underperformers (O) because they want to maintain good relationships by being perceived as supportive (M)

Meetings:

Where data indicate potential for improvement, and commissioners suspect that clinicians need help to achieve improvements (C) and commissioners want to be seen as supportive rather than judging (C) commissioners may offer support to outliers and underperformers (O) because they want to maintain good relationships by being perceived as supportive (M)

Several studies described commissioners accessing data that highlighted outliers in e.g. prescribing or referral activity.[132,202,203] Based on this, if commissioners thought clinicians needed help to achieve improvements, they could offer support in the form of 'corrective action,'[202] targeted support resulting from audit processes that identified outliers,[202] visiting practices to discuss which services could be better developed and look at scope for sharing best practice[203], peer support[132] or visiting GPs to see what kind of help they could use.[136] In a study, a CCG Accountable Officer described visiting GP practices prior to their CQC inspections, and going

through data and discussing how their practice could improve.[136] Commissioners did not want to be seen as engaging in setting performance targets or performance management, causing 'escalations' or 'punishments' such as asking under-performing practices to explain themselves to the members' council or sharing data publicly as a 'warning to improve' (at least in the first instance).[132,204] Commissioners worried that using data in a more punitive way could cause backlash and disengagement[132] or risk alienating practices.[204]

The interviewees[EI3,4,7, CI6, 7,9,12,14,15,17,18,20,21] confirmed these findings, stating that it was important to be perceived as supportive after reviewing data to maintain good relationships with clinicians (*'Are you using it to batter us with or do you really want to work with us to improve things?' and it's always got to be the latter…'*[CI12]). One interviewee expressed scepticism that clinicians would look at comparative data and attempt to learn from other areas, but thought that commissioners could offer support to facilitate this:

> *'…what they're really looking to say is if in Devon for argument's sake, they're in the top percentile for asthma but Newcastle's in the bottom, what can Newcastle learn from Devon that it's not gonna. I don't think that ever happens. I don't think anybody in Newcastle goes to Devon and says, 'What are you doing? What can we learn?" But actually, that's what I try and do in my work is I try and find good, try and work out, you know, work with them to find out what they're doing and a lot of the time I'll use reference sites, so I try and have a network of people so that if there is something that we want to do. So if I was gonna do something in paediatric allergy, I would use Newcastle. I would go to Dr X in Newcastle and*

connect my client in Warwickshire or Bath or Bristol or wherever and say, "Look have a chat to Paul. He's currently running, you know, the paediatric allergy service outside hospital.' [CI9] **(Commissioner interview 9, Consultant for the NHS/CSUs)**

In meetings,[M5,7,14-16,19,28,39,44-47,49-50]commissioners reviewed data indicating scope for improvement. This included data on prescribing, CQC inspections, GP patient surveys and performance on service delivery e.g. delivery of LD health checks. This led commissioners to provide support and help to the outliers and underperformers, which was sometimes described at a high level as offering support or sharing good practice. Commissioners repeatedly stated that they wanted to collect and use data to help rather than judge or 'police', and that they wanted to be perceived as supportive:

'…and we've done that in a very fair way of saying we're collecting the data to help support and not judge and that seems to be changing a bit now…How are we going to tackle that to remain supportive to our practices, to help them understand that the data that we've been collecting has been for support and was never really about this quality management?'[M46] **(Commissioner 46 – B, Meeting 46, agenda item: relating to data on capacity in general practice)**

'I sort of lead on giving the information about where they sit and that the clinical directors offer helpful support. Rather than the clinical directors being seen as the you know in any way policing their own colleagues within their PCN.'[M15] **(Commissioner 15 – C, Meeting 15, agenda item: in relation to data on medicines management)**

This may have been because offering support and help was seen as a more effective solution than a more punitive approach – in one meeting, commissioners contrasted offering guidance on good practice with 'just being marked down' which could make people feel dejected. In one meeting, a commissioner contrasted the CCG's response to a CQC report to the CQC's, with the CQC being described as more 'formal' (and perhaps judgmental) whereas the CCG wanted to understand what had gone wrong to try to help and support practices.[M28]

4.2.2.5 CMO 5: data linked to tailored suggestions

Table 17 CMO 5

CMO across evidence sources:
Synthesis: When commissioners share data with clinicians that is easy to understand and linked to tailored suggestions for action (C) it increases clinician engagement (O) because clinicians understand how to make improvements (M) Interviews: Silence (CMO not present) Meetings: Silence (CMO not present)

Several commissioners linked data to tailored suggestions for action for clinicians (typically GPs) when they hoped to stimulate improvements related to e.g. prescribing. For example, a CCG created a report with data on the number of patients prescribed opioids in a specific practice compared to other local practices, linked to practical suggestions on how GPs could regulate prescribing.[205] Two studies described this type of intervention – in one study, a dashboard application was created displaying graphics to give periodic tailored feedback to GPs, showing where antibiotic prescriptions deviated from guidelines by condition (e.g. Chronic obstructive pulmonary disease or COPD) including tailored, actionable feedback – the study authors suggested that this tool may have been well received because it was different to 'traditional' feedback comprising summary statistics, aggregated practice-level analyses, CCG and regional level assessments, and that there was a great appetite in primary care for this type of feedback.[206] In another study, CCGs asked the study authors to develop and implement an intervention using quasi-experimental controlled interrupted time series analysis to evaluate the effects of a comparative feedback intervention with proposed actions on opioid prescribing in primary care (i.e. combining data on prescribing with suggested actions to reduce opioid prescribing) – during the intervention, prescribing per 1,000 adults fell in intervention practices and continued rising in control practices.[205] One study suggested that not linking data to recommendations could result in them being used less.[207] There is a risk that not providing clear suggestions on what actions clinicians could undertake can trigger disengagement,[197] whereas data combined with actionable feedback has the potential to trigger new insights and learning, in turn improving prescribing practices.[206]

4.2.2 Conceptual category: characteristics of data

The actual and perceived characteristics of data influenced how commissioners used them. The 'actual' characteristics of data relate to the objective attributes of data such as being local or national data or being part of a combined dataset. Commissioners' perceptions of data relate to e.g. the data's perceived trustworthiness, timeliness, and ease of presentation. In general, the characteristics of data served as facilitators or barriers to their usage.

4.2.2.1 CMO 6: variation data for prescribing

Table 18 CMO 6

CMO across evidence sources:
Synthesis:
Silence (CMO not present)
Interviews:
If data indicate a potential cost saving without compromising patient care, especially related to prescribing data (C) commissioners will be inclined to use the data (O) because it is a valid way to make savings (M)
Meetings:
Silence (CMO not present)

Three interviewees[CI3,4,10] spoke favourably about data enabling them to make prescribing cost savings without compromising patient care, e.g. Open Prescribing data:

> *'So within any drug category there will be two or three or more products and* ***we look at is our proportion of the cheapest option as good as in other places and so*** *what would be the impact of us switching to the cheapest option and trying to persuade all our doctors to do that rather than prescribing the more expensive one and we can get that comparison from data relatively easily.'*[CI3] **(Commissioner interview 3, GP, has held multiple commissioning roles including medicines commissioning)**

One commissioner stated that this may be linked to a context of prescribing data because dispensing practices (those who run pharmacies) have 'perverse incentives' whereby GPs can receive a bonus if they prescribe a certain brand of medicine, meaning they might prescribe more expensive medicines even if there is no clinical benefit.[CI10]

4.2.2.2 CMO 7: request of qualitative information to supplement data

Table 19 CMO 7

CMO across evidence sources: Synthesis In contexts where commissioners wish to better understand data (C) they may supplement

data with qualitative information (O) because of the perceived increase in the validity of data (M) and due to a perception that this will give them a fuller and more meaningful understanding of the data (M)

Interviews

In contexts where commissioners wish to better understand data (C) they may supplement data with qualitative information (O) ~~because of the perceived increase in the validity of data (M) and~~ due to a perception that this will give them a fuller and more meaningful understanding of the data (M)

Meetings

In contexts where commissioners wish to better understand data (C) they may supplement data with qualitative information (O) ~~because of the perceived increase in the validity of data (M)~~ and due to a perception that this will give them a fuller and more meaningful understanding of the data (M)

Qualitative information was requested alongside data (as defined within the scope of this thesis, i.e. quantitative data) to provide a fuller and more meaningful understanding of data. Commissioners had access to a variety of qualitative information, including feedback from other commissioners,[208] outputs from focus group discussions,[209] and tacit and experiential knowledge of commissioners.[210] Qualitative information was used alongside data to evaluate a vanguard intervention by supplementing quantitative evaluation measures with complementary qualitative

measures to provide contextualisation,[211] complement data,[212] and commissioners spoke to GPs to understand reasons for variation not reflected by data.[134] One mechanism present only in the synthesis was the potential to use qualitative information to increase the validity of data: this occurred e.g. concerns expressed about increased behavioural problems in children corresponded to data from a local report.[213]

This CMO aligns with the theory of mixed methods research i.e. combining qualitative and quantitative data in e.g. a sequential explanatory design, giving priority to data but using qualitative information to provide validation, enrich the data, and provide more meaning to the data.[214,215] Combining qualitative information and data can help people understand a topic area in more depth, increase confidence in the findings, and add insights that would be missed with only one method.[215]

Interviewees agreed with this CMO, speaking of complementing data with qualitative information to gain a richer and more nuanced understanding of data.[EI3,6, CI1,2,7,8,11,12,14-18,22] Examples included low activity data from a walk-in centre, prompting commissioners to consider shutting it, but after speaking to patient participation groups they realised awareness of the walk-in centre was low, thereby explaining the pattern of activity,[CI16] and using the specific local knowledge of people working in certain areas to better understand RAG ratings and anomalies among them.[CI15] Commissioners also spoke to GPs and clinicians to better understand the reasons behind variation or performance data.[CI8,16,22] This could sometimes provide insight on outliers and context, and help commissioners take an appropriate course of action:

> *'I went to source somebody who had increased their referrals to cardiac support services by 200 per cent and they'd moved multiple variations away from their peer group. So, I thought, "Well it's just something to have a look at really isn't it." So I went along to have a conversation with the GP and it turned out that he was a very small practice who had had a situation around a specific cardiac condition that was genetic and the family that was involved were very large. So he'd gone from making five referrals into a specific service for genetic counselling to twenty-eight just because of size of family."*[CI8] **(Commissioner interview 8, Former Director of Commissioning for a CCG)**

Several interviewees stressed that qualitative information was 'complementary', and that data were prioritised in decision making.[CI11,22,EI6] One interview mentioned that although qualitative information was 'really important, it was more difficult to gather in a 'reputable' way, and that it was more difficult to 'prove' things using qualitative information, but that it could be used to support arguments.[CI18]

In meetings,[M4,7,13,20,48] commissioners also gathered qualitative information to better understand data. This qualitative information sometimes took the form of 'engagement,' described as a process of 'working with' or 'speaking to' or 'having conversations with' clinicians or patients to gain insights.

> *'We are also outliers in our poor use of high-intensity statins which is worrying because we're clearly not doing the best in terms of reducing cardiovascular risk for patients. Not clear on the drivers for this, whether it's a lack of clinical awareness as to NICE guidance, whether it's patients not wanting to take*

high-dose statins, but we're going to do some work on that around others by doing these meetings and starting some conversations.'[M7] **(Commissioner 7 – A, Meeting 7, agenda item: prescribing report)**

Commissioners sometimes had access to data that indicated outliers or worse than expected performance related to health care process measures in certain groups, both relating to the provision of care by clinicians well as the uptake of care by individuals. This included e.g. GP practices that were outliers in antibiotic prescribing,[M13] GP practices whose completion of learning disability health check targets were low,[M4] low levels of COVID-19 vaccine uptake among specific demographic groups,[M33] and variance within a CCG in terms of broad spectrum antibiotic prescribing.[M7] Presented with these data, commissioners subsequently engaged with the clinicians or patients believed to have control over these figures to better understand the drivers and how improvements could be made. One such engagement process involved attempting to understand the low uptake of the COVID-19 vaccine by speaking to religious leaders:

'So when we've looked at our data we've had concerns raised about the level of uptake in particular parts, geographic parts of our community, or particular ethnic backgrounds of our community and we've tried to target them accordingly.

So around about February time we had a very detailed engagement process with the council of mosques and [area] interfaith forum, and they were exceptionally helpful in helping us to understand the issues facing hesitancy, accessibility, and if you remember at that time we talked a lot about…is the

vaccine halal? Do we have translation services in place? Can we use community champions as a way to advocate for the vaccine? And you know our lay chair, [name], has been quite central in some of those conversations as well in in helping us to understand.'[M33] **(Commissioner 33 – A, Meeting 33, agenda item: Primary Care Covid-19 Vaccine Update)**

Further examples of qualitative information commissioners gathered (or planned to) included in-depth interviews,[M1] focus groups,[M22] free text comments in surveys,[M22] and conversations with people thought to be at risk.[M30] In two meetings commissioners made comments about obtaining 'softer metrics'[M28] as well as triangulating figures on satisfaction or dissatisfaction with other information from PCNs and patient participation groups,[M29] although the precise type of qualitative information to be gathered (if any) was not specified. There appeared to be a perception in some meetings that this qualitative information could enhance commissioners' understanding of the data by helping them understand things that could not be easily quantified such as social norms and motivations:

'It was very much a phase one followed up by Healthwatch doing 100 in-depth interviews with people who offered to speak in more depth following their work and phase two will ***bring a fuller report which includes more qualitative data.'***[M1] **(Speaker unknown, meeting 1, agenda item: public and key stakeholder survey)**

*'…****the next step…is to engage with the residents they believe are at risk to help convey that risk across to that group, understand what the social norms are, what the motivational factors are*** *what are some of the things*

that are making people hesitant about coming forth for care, how can we do things differently and also gathering up those patient stories and those resident stories. ***We have a lot of quantitative data but we're not very good at capturing the actual kind of experience of people and we need to be much better…'***[M30] **(Commissioner 30 -A, meeting 30, agenda item: health management)**

4.2.2.3 CMO 8: local vs. national data

Table 20: CMO 8

CMO across evidence sources:
Synthesis In a context where commissioners believe that data do not reflect unique local circumstances or cannot be applied locally (C) they may prioritise gathering or analysis of local data (O) or attempt to contextualise data to local circumstances (O) due to the perception that this can better serve local needs (M)
Interviews Silence (CMO not present)

Meetings:

Silence (CMO not present)

In several studies, commissioners and study authors stated that they sometimes preferred using local data[41,131,136,210,216] or that national or 'universal' (e.g. from trials or papers) data required 'contextualisation' or ideally supplementation with local data[131,190,210,217,218] if they believed that national or scientific data could not be applicable in their locality or did not reflect unique local circumstances.[131,136,210,217,219] One study on evidence use by commissioners confirmed the importance of local data, with a survey of NHS commissioners at PCTs stating that local intelligence was one of the most frequently used forms of evidence.[50] Contextualisation is the process of applying a local lens or filter to data, or tailoring and evaluating national data to local needs based on local knowledge.[131,210] This could mean applying local knowledge to identify limitations of data, such as knowing that there had been a change to a contract, or knowledge of how certain local providers code data and keeping this in mind whilst look at data,[210] or questioning the transferability of the original context in which data was generated to the local area.[42,131] In other studies, commissioners explicitly chose or prioritised local data over national or 'universal' data.[41,131,210] In a study about evidence use in CCGs, a CCG employee stated:

> *'You can't use national statistics to drive what we're doing locally because our patients have different needs and we need to build data up from the ground asking 'Well, what do we need for our patients? How should that look? How will it serve them best from a clinical perspective?'*[210]

4.2.2.4 CMO 9: data to fulfil moral or statutory duties

Table 21 CMO 9

CMO across evidence sources:
Synthesis When commissioners have access to data on health inequalities (C) they may perceive them as useful to achieving a policy and/or moral objective (M) making commissioners more likely to use the data (O)
Interviews When commissioners have access to data on health inequalities (C) they may perceive them as useful to achieving a policy and/or moral objective (M) making commissioners more likely to use the data (O)
Meetings When commissioners have access to data on health inequalities (C) they may perceive them as useful to achieving a policy and/or moral objective (M) making commissioners more likely to use the data (O)

There is a statutory duty of public bodies in England to promote race equality and the Department of Health considers that improving the quality of ethnicity data is an important objective and a necessary step to addressing any ethnicity related health inequalities.[220] In addition, there is a legal duty in the Equality Act 2010 to identify

and publish equality information and objectives.[209] Many of the studies lamented the quality and availability of ethnicity data, but stated that they were important to commissioning, with some studies mentioning work underway to improve the standard of data related to ethnicity,[209,220-223] in some cases spurred by legal duty.[209] Access to data on inequalities could facilitate the commissioning of services to address the needs of minority groups:

> *[The contracting department] need to be knowledgeable about aspects of ethnicity and should get into a mode of thinking about all populations, not just the white middle classes, which has been the tradition in the NHS and I think that's not happening.*[222]

The interviewees also stressed the importance of accessing high-quality data related to inequalities.[EI4, CI2,17,18,20] This was considered necessary as part of the 'policy agenda,'[EI4, CI17] and for moral reasons of promoting equity.[CI20] Accessing such data allowed commissioners to target certain segments of the population who might need tailored services.[CI18]

In three meetings, commissioners aimed to reduce health inequalities using data.[M25,42,43] One committee completed an 'end of life deep dive' where commissioners discussed data on inequalities in end-of-life care and how this could be improved for the whole population.[M43]

4.2.2.5 CMO 10: combined datasets

Table 22 CMO 10

CMOs across evidence sources:

Synthesis

If commissioners have access to combined datasets (C) they will be more likely to use them (O) because the data are useful (M) and because commissioners can gain a fuller understanding of the patient journey (M)

Interviews

If commissioners have access to combined datasets (C) they will be more likely to use them (O) because the data are useful (M) and because commissioners can gain a fuller understanding of the patient journey (M) **and because the data facilitate integrated commissioning (M)**

Meetings

If commissioners have access to combined datasets (C) they will be more likely to use them (O) because the data are useful (M) and because commissioners can gain a fuller understanding of the patient journey (M) **because the data facilitate integrated commissioning (M) and because they have reassurance that the information is comprehensive (M)**

Combined datasets are datasets that combine data from different sources e.g. secondary care and primary care activity and financial data,[208] or public health, epidemiology, and service utilisation data.[224] These combined datasets facilitated comparisons by providing practices with data to compare themselves with,[225]

enabling cross-comparisons with CCGs across a regional area,[210] and allowing for comparisons with practices that have a similar profile.[226] These comparisons were facilitated because commissioners could identify multiple datapoints related to a practice or a CCG (e.g. deprivation levels, population factors) thereby allowing them to choose a suitably similar comparator. In addition, combined datasets enabled commissioners to have a better understanding of the patient journey through the health system[210,227] and a fuller understanding of patients' health and service use[208,228] e.g. combing data from primary, secondary and A&E enabled commissioners to see how patients move around these services.[228]

Interviewees confirmed the utility of combined datasets, including being able to 'track patient journeys' and provided additional examples of combined datasets.[EI7, CI4,6,7,12,16,17,18,20] Combined datasets facilitated population health management,[CI4,12] a form of integrated commissioning, designed to deliver more joined-up health and care services, also focussing on the wider social determinants of health.[229]

Commissioners used combined datasets in two meetings.[M26,27] These data facilitated collaborations with other areas of the NHS (i.e. other than primary care) and therefore integrated commissioning:

> *'That's particularly going to help us with some of the advanced care planning and working closer with our care homes, because our personal health record will allow us collaboration between the patient, the clinician, carers, care home workers, and other people that the patient chooses to allow access to their record.'*[M27] **(Commissioner 27 – A, Meeting 27, agenda item: [area name] Care Record)**

This may have been particularly pertinent given the emergence of ICSs, which were founded in part to help plan and deliver joined up health and care services.[34] A new mechanism of being reassured that the information was comprehensive was identified (*'so that should help us to ensure that there's nothing missed when reviewing a patient…')*[M27]

4.2.2.6 CMO 11: outliers, considering broader context

Table 23 CMO 11

CMOs across evidence sources:

Synthesis

In a context where commissioners feel that factors outside of clinicians' or service providers' control are impacting benchmarking or variation data (C) or the data do not allow for a 'like for like' comparison (C) they will be less included to use the data (O) because they think they are not valid (M)

Interviews

In a context where commissioners feel that factors outside of clinicians' or service providers' control are impacting benchmarking or variation data (C) or the data do not allow for a 'like for like' comparison (C) they will be less included to use the data (O) because they think they are not valid (M)

Meetings

In a context where commissioners feel that factors outside of clinicians' or service providers' control are impacting benchmarking or variation data (C) or the data do not allow for a 'like for like' comparison (C) they will be less included to use the data (O) because they think they are not valid (M)

Commissioners considered variation data as less useful if they felt factors outside of clinicians' and service providers' control were driving performance and preferred to be able to make 'like for like' comparisons with benchmarking data. Different population profiles could lead to different disease profiles, such as deprivation (rather than worse treatment by GPs) driving high hospital admissions[221,230] or high incidences of coronary heart disease driving high levels of prescribing of statins.[231] Unique factors about the local health economy had to be taken into account when considering variation data.[48] It was not always possible to make changes based on variation data.[48] Similarly, benchmarking data were considered more helpful when commissioners could make a 'like for like' comparison, i.e. comparisons with similar areas. This could mean e.g. comparing a GP practice to a very similar practice in the same region[226] or comparing a CCG to another CCG located in a similar city i.e. one with a similar demographic profile and similar deprivation levels.[232] These 'like for like' comparisons meant the data were seen as more legitimate.[226,233]

Commissioners and experts described being sceptical of data if variation or underperformance was based on factors outside of clinicians' or service providers' control, e.g. variation driven by high levels of child poverty, varying cultural expectations and norms around A&E attendance, or personnel fluctuations at a GP practice, but also a willingness to engage with data offering a 'like for like comparison.'[EI1,4, PPII1, CI1-4,7,12,13,16-19] An example of using variation data offering a 'like for like' comparison included looking at data on two different 24-hour electrocardiogram (ECG) contracts and comparing the ECGs completed per annum between two similar sized practices in the same locality area: one practice was completing more ECGs without any noticeable impact on referrals, prompting further investigation and the conclusion that the practice with the higher number of ECGs was completing more than was clinically appropriate, leading to a decommissioning of the service.[CI17]

The same CMO was present in meetings:[M12,16,31,35,38,39] commissioners drew on their knowledge of local circumstances to determine if data were providing 'like for like' comparisons, e.g. when reviewing primary care activity data:

> *'…I would just urge a bit of caution here because the worry is once you start getting into that level of granularity unless you're comparing like with like you open up a really, really, bad discussion and when you add or figure deprivation into this, those practices who've got a lot of deprivation, you can't really compare [name] practice with [name]'…* [M12] **(Commissioner 12 – A, Meeting 12, agenda item: primary care activity data)**

Commissioners could also disregard only some data based on their local knowledge, e.g. when reviewing antibiotics prescribing, one practice appeared to be a 'massive outlier' but a commissioner stated this was because this was a walk-in centre with walk-in patients who did need high levels of antibiotics.[M16] However, the same commissioner stated that they wanted to work with some of the other outliers.[M16] In other meetings, commissioners did use data once they had applied their local knowledge, but adapted how the data were used. For example, when discussing prescribing data, commissioners stated it would be unrealistic to aim to be the lowest in the region given their population and suggested that comparisons with the from another CCG might not be applicable due to them having a different population, but that they should aim to be 'middle of the pack' instead.[M39]

4.2.2.7. CMO 12: interoperability

Table 24 CMO 12

CMO across evidence sources:
Synthesis When data are not captured and presented in an interoperable way with consistent definitions (C) commissioners will have difficulty using them (O) because they have difficulty drawing conclusions (M) and doubt the data's credibility (M) Interviews When data are not captured and presented in an interoperable way with consistent

definitions (C) commissioners will have difficulty using them (O) because they have difficulty drawing conclusions (M) and doubt the data's credibility (M) **and have difficulty following the patient's journey (M)**

Meetings

When data are not captured and presented in an interoperable way with consistent definitions (C) commissioners will have difficulty using them (O) because they have difficulty drawing conclusions (M) and doubt the data's credibility (M)

Interoperability refers to the ability of systems to exchange information and use the exchanged information.[234] A system with semantic interoperability allows for data sharing across organisations and an organisation's internal ecosystem without meaning being lost.[235] Standards and standardised values allow sharing of data between different people, achieving semantic interoperability.[235]

Due to various inconsistencies with data, (semantic) interoperability was impeded which made it difficult for commissioners to use the data. Interoperability was impeded in many ways, including differences in cost allocations,[48] different denominators in data,[220] changes in boundaries and indicator sets over time,[220] clinical variation in data recording,[213] inconsistent categorisation of activity (e.g. not recording secondary diagnoses consistently),[10] inconsistencies in recordings and coding of hospital interventions,[51] and lack of consistency in the way data are collected by age cohorts.[236] Other studies highlighted a general lack of standardisation across coding.[225,237,238] Such inconsistencies reduced the credibility

of data and meant commissioners were uncertain if they were comparing 'like with like'[238] and made it difficult to use the data for monitoring,[239] comparing data across time and place,[220] and assessing the prevalence of health problems.[225]

Interviewees described similar challenges due to inconsistent coding and definitions.[EI1,2,4,7, CI6,9,16,18,22] An additional finding was that a lack of interoperable data between primary and secondary care prevented commissioners from being able to view the full 'patient journey' and therefore made the data less likely to be used in commissioning:[EI1, CI9]

> *'…it doesn't help that we don't have interoperable systems, so primary care use different systems to secondary care and we can never look at the data in one place and yet if you look at the pharmaceutical industry…there are companies out there that could take the hospital and the primary care data and put it all in one system and let us look at that data live… So, it's doable but for some reason in the NHS we just don't do it…We've never bitten the bullet and said we need to have an inter-operable system between primary and secondary care so if Alexandra goes to hospital today but comes to see Scotland general practice tomorrow, I could see what the hospitals done. Other than that, I'm relying on Alexandra being able to tell me what the hospital did, what the conversation was… So the interoperable, the lack of an inter-operable system in the NHS absolutely hinders the commissioning process.'*[CI9] **(Commissioner interview 9, Consultant for the NHS/CSUs)**

In meetings there was evidence for the same CMO as in the synthesis: the data commissioners used sometimes lacked standardisation thereby impeding

interoperability, for example because GPs used different templates for capturing data,[M11] or because GPs had different ways of recording appointments.[M12] This led to doubts about credibility, as it was e.g. difficult to ascertain if variation was true variation or due to differences in recording:

> *'And is the variation here true or is it to do with recording? I said at the start that there's potential for differences in recording between providers, every GP practice is a provider…these [inaudible] seven practices within that network, there's no guarantee that they're all recording their appointments in the same way'* [M12] **(Meeting 12, Commissioner 12 – B agenda item: primary care activity data)**

4.2.2.8 CMO 13: mistrust of data based on clinical experience

Table 25 CMO 13

CMO across evidence sources:
Synthesis
In a context where (clinical) commissioners find that the data available contradict or are in tension with their experience and knowledge (C) commissioners may become skeptical of the data (O) because they are mistrustful (M)
Interviews
In a context where (clinical) commissioners find that the data available contradict or are in

tension with their experience and knowledge (C) commissioners may become skeptical of the data (O) because they are mistrustful (M)

Meetings

In a context where (clinical) commissioners believe there is misalignment between data and their own clinical experience **or information received from other clinicians** (C) commissioners may become skeptical of the data (O) because they are mistrustful (M)

Clinical commissioners sometimes doubted the accuracy of data based on their clinical knowledge and experience. Clinical commissioners cast doubt on the conclusions drawn from data (e.g. questioning whether an activity could be reduced by a certain factor since this did not align with what GPs thought was possible[51]) as well as the data themselves (e.g. questioning the accuracy of a tool if it identified too many patients unknown to the clinical team[131]). Judgements about the utility of data could be made by comparing data to clinical and practice-based knowledge such as questioning if people were actually being admitted for the condition the data claimed they were.[131]

Two interviewees[CI4,14] agreed with this CMO, stating that a mismatch between data and clinical experience could lead to mistrust and therefore disengagement:

> *'…if the data doesn't kind of match what you're seeing, you might try and challenge it. If it is justifying and showing what you're feeling, what you're expecting and it is useful to be a working clinician, working in commissioning and there's a threat that they're changing it so we're not going to have working clinicians…just trusting data is dangerous. Just trusting gut feeling is*

dangerous…it's when you, you see the two and they match, you know the data is trustworthy. When you see the two and they're not matching there's an issue with that data."[CI14] **(Commissioner interview 8, Clinical commissioner (GP))**

In meetings,[M4,34,35] commissioners cast doubt on the accuracy and trustworthiness of some data based on their own clinical knowledge or knowledge obtained from clinicians, for example:

'…*I picked this up with it because it looks like we're a bit behind but I'm aware that there's often a data lag in terms of the flu vaccination information so I had, it was my meeting with [practice] yesterday, one of our bigger practices, and they are at 80 odd percent of over 60s I think they've now vaccinated or…anyway, they're way ahead of the figures that we've distributed so I think what I'm going to try to do is ask the practices to let us know where they stand in terms of the actual flu vaccination campaign. There are reasons why we'd be a bit behind and obviously with the 12- to 15-year-olds a lot of the flu visits have been taken by the COVID campaign, but I don't think we're quite as far behind last year as actually this data maybe portrays…'* [M34] **(Commissioner 34 – A, Meeting 34, agenda item: flu update)**

Further examples included a clinical commissioner casting doubt on data about vaccination statistics for pregnant women since they seemed 'very high.'[M4] In one meeting, a commissioner expressed doubts about the accuracy of data due to feedback from clinicians, i.e. from practices indicating that the actual usage of

Enhanced Access Service usage were probably higher than the 'official' data suggested.[M35]

4.2.2.9 CMO 14: presentation of data

Table 26 CMO 14

CMO across evidence sources: Synthesis Presenting key pieces of data in a succinct and easily digestible manner to commissioners (C) can increase the likelihood they will be used (O) since this increases their engagement with and understanding of data (M) Interviews Presenting key pieces of data in a succinct, **visually appealing**, and easily digestible manner to commissioners (C) can increase the likelihood they will be used (O) since this increases their engagement with and understanding of data (M) Meetings: Silence (CMO not present)

Presenting data in a succinct and easily digestible manner can increase commissioners' understanding of and engagement with data, such as presenting

data on a single A4 sheet of paper,[41,131] circulating an activity report prior to meetings[240] or a spreadsheet.[209] This captured commissioners' attention,[41] helped them 'digest' the data[203] and made the amount of data available more manageable.[131]

Interviewees confirmed that sharing data in a succinct manner such as dashboards, infographics, or maps with hotspots increased engagement.[CI1,3,4,9,10,13,17,22, EI4-7, PPII2] Some lauded this way of presenting data because they (or their colleagues) had trouble using programmes such as Excel or understanding large datasets.[CI17,22] Interviewees noted the potential of data presented in a visually appealing way to trigger engagement:

> *'…if you can put up a presentation or you can put together a document which is presented beautifully with pretty pictures which are professionally put together… you take a document and it is pulled together by people who really know how to take data and how to set up a document, people look at that and go, "Oooh." They'll make their decisions on, 'Is it easy to read? Is it well presented? Is it a, a glossy document?'… and it's very visually helpful and to be perfectly honest to try and get people to understand things, if you can't put a pretty picture in front of them it just doesn't work. Give them a table of data and numbers and they will cringe. Give them a pretty picture in a diagram and they're all happy…'* [CI10] **(Commissioner interview 10, Director, CCG)**

Commissioners sometimes felt overwhelmed by the amount of data they had access to, and that presenting it succinctly could alleviate this.[PPII2]

4.2.2.10 CMO 15: ability to view trends

Table 27 CMO 15

CMO across evidence sources:

Synthesis

Where commissioners have access to data that show trends and developments over time (C) they will be more inclined to use them (O) because they consider this useful (M) and think this will provide a less 'distorted' view (M)

Interviews

Where commissioners have access to data that show trends and developments over time (C) they will be more inclined to use them (O) because they consider this useful (M) and think this will provide a less 'distorted' view (M)

Meetings

Where commissioners have access to data that show trends and developments over time (C) they will be more inclined to use them (O) because they consider this useful (M) ~~and think this will provide a less 'distorted' view (M)~~

Each of the three evidence sources contained a small amount of support for this CMO: showing trends and developments over time was useful because it enabled commissioners to view and monitor trends.[136,241 CI12, M20] In addition, in the synthesis and interviews evidence showed that access to real-time data was perceived to

reduce the risk of distorted conclusions. One study described the risks of using only snapshots of data, which could to a risk of people drawing false conclusions:

> *'Data drawn from constantly changing situations can be misleading because of the changing denominator. Because of patients moving on and off the practice list, a practice with a particularly mobile population may have immunised more than 100% of their practice population but still have 10% of children without immunisations, whereas another practice with a more stable population may have immunised 99% and only have 1% without immunisation. Data catches a snapshot of more complex stories-in-evolution.'* [241]

According to an interviewee, only having access to data showing trends or developments (i.e. only 'snapshots') carried the risk of showing a skewed view of data.[CI12]

4.2.2.11 CMO 16: inaccurate data

Table 28 CMO 16

CMO across evidence sources: Synthesis In a context where commissioners suspect that commissioning data are inaccurate or contradictory (C) they will not use them in commissioning decisions (O) because they do not trust them (M) and have difficulty drawing conclusions (M)

Interviews

In a context where commissioners suspect that commissioning data are inaccurate or contradictory (C) they will not use them in commissioning decisions (O) **and may seek alternative sources of evidence, including qualitative information (O)** because they do not trust them (M) and have difficulty drawing conclusions (M) **and they fear it may be challenged and lose credibility (M)**

Meetings

In a context where commissioners suspect that commissioning data are inaccurate or contradictory (C) they will not use them in commissioning decisions (O) because they do not trust them (M) and have difficulty drawing conclusions (M)

A common data challenge arising in the synthesis was when data were discrepant or contradictory,[51,128,131,242] e.g. GPs mistrusting hospital and budgetary data from the PCT when their own practice systems gave them different numbers[128] or inconsistencies between performance data and a hand count of records, as described by a senior clinician:

> *'I sat down for a weekend and actually went through a year's worth of referrals and counted them up and showed much higher activity than appears to be showing on the performance data.... So that's a major concern.'*[242]

Other data quality issues mentioned included unreliable data,[225] poor-quality data,[219] inaccurate data,[243] invalid data.[240] This triggered feelings of mistrust[128,131] or

concern[242,244] in contrast to data considered to be credible which could trigger involvement and engagement.[226]

The interviewees confirmed this CMO[CI5,6,15, EI5] adding the mechanism of worrying that low-quality data could be challenged, causing a loss of credibility:

> *'…if something doesn't really meet what our quality standards are, we will go back to the data provider or the CSU and kind of say, we can't really use it like this because yeah because I think if we go to a commissioning conversation or commissioners with, with poor data, it can be immediately disregarded and now our credibility's kind of lost as well.'*[CI6] **(Commissioner interview 6, GP/experience of quality improvement work)**

In two meetings, commissioners had poor-quality LD health checks data, leading them to become suspicious and mistrustful.[M40,41]In meeting 41, commissioners also had access to data on LD health checks they believed were incorrect due to numerous faults, including some practices claiming over 100% completion, and the data from CQRS and GP practices that contradicted each other. Commissioners could therefore not actually tell if they had met their target in terms of health check completion, with one set of data showing they were below the target and one showing they had exceeded it:

> *'So it's quite frustrating, not being able to rely on the data which is why I haven't brought all of the data because it just doesn't make sense.'*[M41] **(Commissioner 41 – A, Meeting 41, agenda item: LD health checks)**

4.2.2.12 CMO 17: data overload and capacity

Table 29 CMO 17

CMO across evidence sources:
Synthesis In a context where commissioners have access to more data than they can manage (C) they may feel frustrated (M) and uncertain about what to prioritise (M) meaning they are less likely to use the data (O)
Interviews In a context where commissioners have access to more data than they can manage (C) they may feel frustrated (M) and uncertain about what to prioritise (M) meaning they are less likely to use the data (O)
Meetings Silence (CMO not present)

A context of 'data overload' left commissioners frustrated,[131] unable to access data quickly[245] and at times feeling left to their own devices to make decisions about what type of data to prioritise, which they sometimes did not know how to do.[239] This meant that data were either less likely to be or less quickly used, or not able to be

used at all.[48,239,245-247] Several studies mentioned that commissioning organisations did not have the capacity or resources to analyse data,[48,131,245-247] and one study noted a broader lack of processes and systems to identify and highlight pertinent data to commissioners.[239]

Interviewees confirmed that if commissioners had access to more data than they could manage, they sometimes were uncertain about what to prioritise, which in turn could make them feel overwhelmed and therefore less likely to use the data, or avoid them completely:[CI1,3,5-7,14,15,20,22, EI1,7, PPII2]

> *'…that's a huge problem and I think that also contributes to data fatigue if you are constantly presented with hundreds and hundreds spreadsheets with rows and rows and rows, I think that as a commissioner that's overwhelming and it's boring and it's not interesting…'*[CI1] **(Commissioner interview 1, Population Health and Finance Manager)**

4.2.2.13 CMO 18: ability to see financial implications of data

Table 30 CMO 18

CMO across evidence sources:
Synthesis
In a context where commissioners have access to data linked to cost implications (C) they will be more inclined to use them (O) and may prioritise the data over other forms of evidence (O) because the evidence aligns with what they want to understand (M) and because it aligns with a priority they consider important (M)

Interviews:

In a context where commissioners have access to data linked to cost implications (C) they will be more inclined to use them (O) and may prioritise the data over other forms of evidence (O) because the evidence aligns with what they want to understand (M) and because it aligns with a priority they consider important (M)

Meetings

Silence (CMO not present)

Commissioners repeatedly stated that they had an interest in data that could help them estimate the cost of commissioning decisions, and that they wanted clinical and health data to be linked to data on financial implications. Commissioners wanted data to show them how to make efficiency savings,[48] understand the cost of a pathway,[248,249] to translate strategic issues to funding implications,[190] show the cost implications of a potential technology,[246] provide the potential financial impacts when making decisions,[250] and translate commissioning activity to monetary value.[216] Commissioners were critical of sources of data that were not linked to cost implications:[48,246]

> *'What I want to know is: where do we have the largest potential for efficiency savings, that don't harm patients . . . the Atlas alone can't tell me that'*
> (Financial Director, PCT12)[48]

Commissioners prioritised data on costs and used it more routinely in commissioning than other forms of evidence,[209] including prioritising data on cost implications over

other types of data such as health economics data, which includes e.g. Cost Effectiveness Analysis, cost utility calculations and QALY data.[246] In addition, it was important for commissioners to be able to see the short term costs of potential interventions, since they are allocated annual budgets.[251]

Interviewees confirmed this CMO, e.g.: [CI4,8,10]

> *'to be perfectly honest, although all of this is about patients, ultimately it's about meeting our statutory obligation to, to break even…'*[CI10] **(Commissioner interview 10, Director, CCG)**

4.2.2.14 CMO 19: potential to segment data

Table 31 CMO 19

CMO across evidence sources:
Synthesis When commissioners have access to data they can segment and 'drill down' in (C) they are more inclined to use the data (O) because they are able to create targeted and tailored commissioning decisions (M)
Interviews When commissioners have access to data they can segment and 'drill down' in (C) they are more inclined to use the data (O) because they are able to create targeted and tailored commissioning decisions (M)
Meetings When commissioners have access to data they can segment and 'drill down' in (C) they

are more inclined to use the data (O) because they are able to create targeted and tailored commissioning decisions (M)

Several studies noted the importance of being able to segment and disaggregate data in multiple ways including by population group, health conditions, and data on service use by ethnic group.[209,228] In one study on perceptions of a local database of routinely collected primary care data, participants spoke generally about the importance of being able to segment and disaggregate data in various ways.[228] Another study focussed on evidence use relating to ethnic diversity and inequality by commissioning managers and concluded that an inability to segment population- and service-level data by ethnicity meant commissioners could not assess the health needs across ethnic groups and redesign or reprioritise services to address ethnic inequalities.[209] Being able to 'drill down' in or segment data this way enabled more tailored and targeted commissioning decisions to be made, including data enabling commissioners to understand patient need and therefore resources at a practice level, which was in turn used to inform the negotiation of contacts,[252] using data disaggregated by ethnicity to monitor access to and outcomes of services for service improvement,[209] or look at prescribing data down to the practice level enabling commissioners to give feedback to GPs.[253]

Commissioners agreed with this CMO, with several interviewees criticising a lack of access to data they could segment, with one interviewee lamenting that they only had access to a screenshot and .PDF file of data, meaning they could not manipulate it.[EI2, PPII3, CI1,3, 5-7,10,12,13,15-18] One interviewee described how being able to

'drill down' helped them better understand an initially seemingly contradictory piece of data, and thereby develop a more tailored enhanced service:

> *'…one of the things in one of the localities I worked in which was a borough of significant inequalities, one area really, really rich, leafy, suburbs, actually where most of the GPs lived and the other side of the tracks was really, really, really rundown and very poor, poor health outcomes for people but their, you know, their rate of prevalence for heart disease and COPD in the poor area was lower bizarrely…But when we drill down into that, the reason it was lower was actually because people died before they got on any registers so actually their life expectancy was that much lower that they didn't and they visited GPs less frequently so they never actually got onto register…so the registers started to come in much more as part of enhanced services so actually tried to concentrate the mind and underpinning that is about what would you expect in a population of your health, of your, with your prevalence, deprivation prevalence etc, what would you expect in a locality like yours and if you're way off being, you need to do some digging basically.'*[CI7] **(Commissioner interview 7, commissioner with a range of experience including commissioning and change management roles)**

Several meetings supported this CMO.[M6,15-17,25] This included data on COVID-19 vaccine uptake[M15] that commissioners could break down in various ways, including by ethnicity and deprivation, in turn facilitating the development of customised solutions, as commissioners could see where uptake was low. Further examples include commissioners described 'drilling down' data on influenza vaccination uptake

to the individual GP practice level, leading them to work with practices with zero uptake and better understand why this might be the case,[M17] and looking at data on LD health checks, and breaking down the data to the practice level to develop targeted support.[M16]

4.2.2.15 CMO 20: timeliness of data

Table 32 CMO 20

CMO across evidence sources:

Synthesis

When commissioners have data that are considered 'real-time' or recent (C) they will be more inclined to use them in commissioning decisions (O) because they find them useful for providing immediate support or enabling speedy decisions (M) and they have trust that the data reflect the current situation (M)

Interviews

When commissioners have data that are considered 'real-time' or recent (C) they will be more inclined to use them in commissioning decisions (O) ~~because they find them useful for providing immediate support or enabling speedy decisions (M)~~ because they have trust that the data reflect the current situation (M)

Meetings

When commissioners have data that are considered 'real-time' or recent (C) they will be more inclined to use them in commissioning decisions (O) because they find them useful for providing immediate support or enabling speedy decisions (M) and they have trust that

the data reflect the current situation (M)

Commissioners expressed wanting access to either real-time or more timely data[131,138,201,220,248] and expressed frustration with the timeliness of the data they had access to.[128,203] The challenges of having data that were not up to date included the data no longer reflecting current circumstances.[48] In addition, several tasks were impeded by not have timely data, including monitoring performance against budget due to a delay in receiving Payment by Results data[128], monitoring progress or improvement in a CCG[232], or complete business cases, as these were rejected by a PCT when GPs put these together with untimely data from practice records.[128] Access to real-time or near real-time data could enable commissioners and practitioners to remain engaged and react quickly to issues, whereas data that were not real-time sometimes can too late to make a difference.[254]

Interviewees confirmed this CMO.[EI4, PPII2, CI2-4,6,10,11,14-17,19-22] Out of data or untimely data posed two key challenges: firstly, in some instances commissioners could not be certain if data still reflected reality:

> *'… some of the data we have to use is three years out of date. Things like numbers of patients, populational data that you rely on a census is by the time it's done is actually not very useful because that population has already changed…Good example at the moment is the, the numbers of Europeans obviously in the census. Now we, half, half of them or a third of them may not be in the UK and some of the patients we think are in the UK may not be and may be stuck somewhere else and we are supposedly putting services in with*

data that's five years out of date."[CI14] **(Commissioner interview 14, clinical commissioner (GP))**

A second issue with untimely data arose when commissioners attempted to use data to monitor or improve performance, since they risked presenting data to clinicians only to be told they no longer reflected reality:

'Well, when you have clinicians in the in the meeting, they'd say, "Oh we've changed our practice completely now… for GP prescribing, you know, they'd say, "Oh we don't, we don't prescribe that expensive drug anymore." [E14] **(Expert interview 4, academic at a university)**

In meetings,[M16,25,34,36,37] commissioners talked about the timeliness of data and how this impacted how data were used. Real-time or recent data were considered preferable, as these could enable commissioners to provide support or make decisions quickly, and commissioners could be reassured that they reflected the current situation. For example, commissioners complained about non-recent data which could be 3 to 4 months in arrears,[M16] and a 'data lag' on flu vaccines that meant actual numbers of vaccines administered were higher than the data suggested.[M34] Commissioners stated they ideally wanted 'real-time' data,[M25,36] and lauded improvements to the frequency of data reporting, e.g. going from quarterly to monthly in arrears report.[M37]

Having access to recent data made it easier for commissioners to made speedy decisions and provide quick support.[M25,36,37] Data several months out of date made this more difficult*:*

'It just feels it makes it very hard doesn't it to understand whether we're on track or not and therefore to be able to take further actions if necessary to try and [inaudible] uptake if we only get partial information in three or four months arears so I don't know if there's any way of getting a more regular information through to support that'[M16] **(Commissioner 16 – B, Meeting 16, agenda item: LD health checks)**

4.2.2.16 CMO 21: 'imperfect' data

Table 33 CMO 21

CMO across evidence sources:
Synthesis If commissioners have access to flawed or imperfect data they understand the limitations of (C) and this is the only type of data they have access to (C) they will still try to use the data (O) because they can adapt them in ways that are useful while taking into account the data's limitations (M) and they believe this is better than using no data at all (M)
Interviews If commissioners have access to flawed or imperfect data they understand the limitations of (C) and this is the only type of data they have access to (C) they will still try to use the data (O) because they can adapt them in ways that are useful while taking into account the data's limitations (M) and they believe this is better than using no data at all (M) **and**

the data make decisions more defensible (M)

Meetings

In a context where commissioners have access to 'imperfect' data they understand the limitations of (C) and this is the only type of data they have access to (C) **and/or they have a commissioning issue they (urgently) want to address and/or (C) they feel they have an obligation to use the data (C)** they will still try to use the data (O) because they can adapt them in ways that are useful while taking into account the data's limitations (M) and they believe this is better than using no data at all (M)

Commissioners noted that in a context of having incomplete data or a lack of data but still wanting to make decisions using data, it was important to either use estimates or attempt to work around incomplete data.[209,210,240] Using data this way was viewed as preferable to 'doing nothing' as they could still produce useful insights with it.[209,210] However, this did not mean commissioners were prepared to always use poor quality data – in one study, a commissioner stated it was best to ignore data where the data quality was not sufficiently robust, suggesting that having an understanding of just how flawed the data were, and its limitations, were a precursor to using them *('knowing which fields or records we should just ignore because we know the data quality's not sufficiently robust'*).[210]

Interviewees confirmed the CMO.[CI1,4,18,20, EI1,5,6] Some interviewees were sceptical of commissioners ever having access to 'perfect' data: *'…if you waited for the perfect dataset it would never come.'*[EI1] Commissioners were still able to use the data while

considering and understanding the data's limitations, QOF data, which was voluntary and therefore potentially incomplete, but said it was still useful for providing an indicator of where attention might be needed,[CI20] and data from GP consultations which was not always populated consistently.[CI1]

An interviewee described their approach as follows:

> *'…we do have flawed data and there are some bias in there and I think that's the bit to try and understand if there is a bias, yes we still use it because we actually don't have anything else because in, it's kind of something is better than nothing but actually knowing the basis that might be in there it is kind of can account for an element of it…yes we still use it even though we know it's not perfect but we are usually aware of the perhaps unintended consequence of the data that might be being used.'*[CI18] **(Commissioner interview 18, Estates (Primary Care), Deputy Director)**

An additional mechanism identified in one interview was a commissioner stating they were confident in using 'imperfect data' if they understood its limitations because they could incorporate this into their analysis, thereby reducing the risk of others 'rejecting' the resulting analysis, since the data made their decisions more defensible:

> *'I work closely with a, with a GP who kind of he provides me some of the, the context around some of the data…I don't know how EMIS works, I don't know what the interface is like and how it's populated from this side of the GP but me having that information helps me to kind of provide a much more kind of, much more detail in my analysis and understand kind of where the caveats*

should be or what should and shouldn't be included. ***But I think if, if that link isn't there then you can kind of do a lot of analytics and be given to, you know, practices or commissioners and have them kind of immediately reject it because you've missed some kind of critical…information about the data.'***[CI1] **(Commissioner interview 1, Population Health and Finance Manager)**

In meetings, commissioners also sometimes had access to data that were 'imperfect' in the sense that they contained identifiable flaws, and commissioners understood these flaws and how they might impact analysis.[M1-6,26,31,32] Examples of such 'imperfect data' included a survey on accessing health services that did not contain detailed information on certain demographic groups (e.g. gypsies, Roma and travellers, carers)[M1] data on flu vaccines based on informed (estimated) rather than actual data[M4] or data on access in primary care that was 'not 100% accurate' but considered 'a good proxy.'[M26]

There were several contexts associated with commissioners using such data: firstly, as in the synthesis and interviews, commissioners suggested it could be too difficult to obtain 'perfect' data for various reasons. These included not wanting to ask every GP practice in an area to confirm the number of partially completed health checks during COVID-19 where these data could not be pulled from a reporting system[M2] or having access to good but flawed data,[M3,4,26,31] for example:

'So it's not 100% accurate. It's partially determined by the information that's uploaded from practices directly. But it's a good measure, it's a good marker.'[M3] **(Commissioner 3 – A, Meeting 3, agenda item: workforce)**

> *'So this information comes from NHS digital, it's, it's pulling in, it's pulling data from a number of systems, it's not 100% accurate, because it's pulling data indirectly, but it's a good proxy…'*[M26] **(Speaker unknown, Meeting 26, agenda item: quality reports)**

A further context discovered in the meetings was commissioners using 'imperfect' data when faced with urgent issues, e.g. remote access to health and care services during the COVID-19 pandemic (*'As you can imagine it's a bit of a hot topic at the moment finding out what people feel then can experience about remote access.'*[M1])

Finally, an additional context in the meetings was commissioners' perceiving an obligation to use 'imperfect' data: in several meetings across several CCGs, commissioners discussed data from the annual GP Patient Survey (GPPS), an England wide survey administered by Ipsos MORI. Commissioners across CCGs raised some concerns about the survey data, mainly related to the small sample size,[M32] difficulty in drawing conclusions at practice level,[M5] and the fact that people completing the survey might be more likely to be 'disgruntled' leading to concerns about statistical significance.[M6] Commissioners employed various strategies to be able to draw on these 'imperfect' data, including combining the data with other sources of evidence, perhaps to enhance its validity:

> *'…as we've said repeatedly this it's a blunt instrument the performance dashboard but it does give us an indication of where there are problems. It's by no means ever dealt with in isolation and we appreciate it doesn't always effectively reflect necessarily the detail of what's going on in practices. But what we do know is we can we can typically see when we know there's a*

*problem…in a practice within the next three months in the dashboard that starts to be reflected in terms of the number of outliers….**But taken with that soft data that we have within the team it's still a useful tool.**"*[M31]**(Commissioner 31 – C, Meeting 31, agenda item: General Practice Contract & Quality Visit Report)**

4.2.3 Conceptual category: commissioners' capabilities, roles, perceptions, and intentions

Commissioners' capabilities, including their skillsets, capacity for analysis, and understanding of data, influenced how they used data. Having a commissioner in the role of a data champion increased engagement with data. Commissioners' perceptions of data and their environment, notably the degree to which they felt financial pressure, impacted to which extent data were used. In addition, commissioners sometimes used data as a tool for persuasion, which involved the selective usage of data whereby data were chosen selectively (or retro-fitted) to legitimise and support what commissioners wanted to do, rather than drive decisions from the outset.

4.2.3.1 CMO 22: perceived financial pressure

Table 34 CMO 22

CMO across evidence sources:

Synthesis

In a context where commissioners are subjected to financial pressures (C) they may choose to make commissioning decisions based on little or no evidence (including data) (O) because they feel obliged to prioritise financial issues (M)

Interviews

In a context where commissioners are subjected to financial pressures (C) they may choose to make commissioning decisions based on little or no evidence (including data) **including at the expense of using data related to potential (clinical) improvements (O)** because they feel obliged to prioritise financial issues (M)

Meetings

Silence (CMO not present)

One study described a situation in which commissioners funded initiatives without an evidence base because they had a statutory duty to deliver a 'viable financial plan.'[41] A quote from another study on the factors that facilitate or impede research utilisation in NHS policy making noted that financial or corporate policies could override what research suggested for purchasing decisions.[127] Commissioners faced considerable short-term financial pressures, with one stating that investing in something that could 'deliver' in 10-15 years was 'less attractive.'[255]

The interviewees confirmed this CMO, stating that commissioners were often subjected to financial pressures trumping the usage of evidence, including data, describing the NHS as 'cash strapped,' outlining the pressures of the annual commissioning cycle, and stating that the budget 'had to balance.'[CI1,3,7,10,22, EI4]

An additional potential outcome identified in the interviews was the potential for financial pressures to trump the usage of data relating to potential (clinical) improvements. An expert spoke of treatments for non-life threating conditions such as varicose vein surgery and fertility treatments being stopped or limited despite the existence of data that these could at least potentially lead to clinical improvements related to quality of life due to budgetary pressures.[EI4] This sentiment was echoed in interviews with commissioners:

> *'…sometimes it's like what's the point of looking at all this data and saying, "we need to tackle this," when you know there isn't a penny…That's actually really disheartening I think, you know, when PCNs do come to us and then they've got all of these innovative ideas about what they could do having looked at the data and actually we've not, you know, there's nothing left in the mattress to give to them to do it, it's, you know, it's deflating all round to be honest.'*[CI22] **(Commissioner interview 22, commissioners with management/Director level roles (both interviewees))**

4.2.3.2 CMO 23: ability to choose and select data and metrics

Table 35 CMO 23

CMO across evidence sources:

Synthesis

In a context where commissioners can choose and select data and metrics they use (C) they will become more engaged and inclined to use the data (O) because they are meaningful and valid to them (M)

Interviews

In a context where commissioners can choose and select data and metrics they use (C) they will become more engaged and inclined to use the data (O) because they are meaningful and valid to them (M)

Meetings

In a context where commissioners can choose and select data and metrics they use (C) they will become more engaged and inclined to use the data (O) because they are meaningful and valid to them (M)

Two studies suggested that the ability to choose data and metrics could increase commissioners' engagement with data. In one study, English GPs only valued monitoring data when they had chosen the data they perceived to be meaningful and useful.[256] In a study describing the NHS health check (NHSHC) programme, commissioners and leads criticised the metric of uptake percentage, with some

calling it ‘meaningless,’ and questioned the validity of national uptake data and metrics.[238] They did make alternative suggestions about how the programme could be monitored,[238] which they likely perceived as more meaningful and valid.

Interviewees confirmed the CMO:[CI8,14, EI3,4] this applied both to commissioners (i.e. commissioners being able to select the data and metrics they were evaluated against) as well as the clinicians who were monitored and evaluated by commissioners. One commissioner described agreeing a metric with GPs whereby GPs were given remuneration when they avoided admissions, after working with them to get GPs to understand why this was important.[CI8] An expert described how choosing metrics could increase commissioner engagement:

> *‘It’s so important isn’t it that you could say, “This is what we want to be measured on this year…I think because if you’re, if you’re able to articulate that then and then get yourselves working as a team towards it it’s, it makes all the difference, I think.*
>
> *… because they quite a lot of the time they said they feel that some of the kind of imposed on then rather them kinda having a bit more input into how the data should be collected or how they should be looking at it…’*[EI3] **(Expert interviewee 3, academic at a university)**

There was a small amount of evidence from one meeting[M31] to support this CMO - commissioners discussed a paper that included data on practice performance and outliers. One commissioner expressed that some of the commissioners were dissatisfied with some of the parameters and indicators. The commissioner requested a discussion about altering the indicators, stating they had ideas about

indicators that would provide a better fit, suggesting that being able to choose metrics could increase commissioner engagement.

4.2.3.3 CMO 24: inability to understand the drivers of data

Table 36 CMO 24

CMO across evidence sources:
Synthesis Commissioners will be less inclined to utilise data (O) if they cannot operationalise them (M). This can occur in a context of not being able to transform data into 'information' (C)
Interviews Commissioners will be less inclined to utilise data (O) if they cannot operationalise them (M). This can occur in a context of not being able to transform data into 'information' (C)
Meetings Commissioners will be less inclined to utilise data (O) if they cannot operationalise them (M). This can occur in a context of not being able to transform data into 'information' (C)

To form this CMO, I drew on Ackoff's theory of the data-information-knowledge-wisdom (DIKW) hierarchy which has data at the lowest rung, and explores the processes linked with the transformation between these components.[257,258] Data are products of observations and merely symbols, but are not usable until they are in a relevant form.[257,258] Information is inferred from data and has been processed to be useful by answering who, what, where and when questions.[258] Above are the rungs of knowledge (answers 'how questions'), understanding (appreciation of 'why') and finally wisdom[257,258] Dammann proposed a modification to this hierarchy whereby

data (in the sense of numbers, symbols and values) are on the lowest rung, followed by information (used as source for answering questions) followed by evidence (used for analysis and hypothesis-testing to support claims and decision-making).[259]

In several documents, commissioners had access to data (according to Ackoff's and Dammann's definitions, i.e. pure numbers) that they could not operationalise. Commissioners sometimes had challenges understanding the drivers of data. For example, some commissioners could not understand if data meant something 'good or bad' was happening,[210] understand the meaning of variations,[247] understand outliers,[247] drivers of costs[131] or understand different rates of prescribing across surgeries.[7] An inability to understand these drivers meant commissioners could not draw meaning from the data[210] and were unlikely to utilise it in decision-making.[247] The data had not (yet) been transformed into information, i.e. something that could be used to inform decision making.

Interviewees confirmed this CMO,[CI2-4,13] providing examples of data they had difficulty operationalising, e.g. RightCare data:

> *'It says we spend more than everybody else so we should make that saving. Rather than, 'Is there a reason why we spend more than everybody else because we spend more in this way because we spend less in this way?' You know, those sorts of things, or where there was variation internally between our different providers, those sorts of things…Well, the methodology is a little bit mysterious. People don't fully understand how they achieve their results and their graphs and you can never be sure what's a good variation and what's a bad variation. We can identify that there's a bad variation in terms of*

expenditure. i.e., we're spending a lot of money on this procedure. Well, we're not always sure whether that means we're doing the right thing..."[CI4]

(Commissioner interview 4, Deputy Director of Finance for a CCG)

In several meetings,[M1,3,21-25] commissioners had access to data (according to Ackoff's and Dammann's definitions, i.e. pure numbers) they could not operationalise. In some meetings, this was because they could not understand the drivers of the data, e.g. commissioner noting there had been a 'big drop' in SIRMS [Safeguard Incident and Risk Management System (SIRMS)] reporting, but that the data was not accompanied by information on the reasons behind this.[M21] Similarly, from another meeting:

'And whilst there is some national attempts to look at GP appointment data the reason it hasn't been done before now is because it's really very difficult to make any sense of this and we've got kind of broad numbers but, you know, it's you can only really see trends it doesn't really tell you what's going on."[M25]

(Commissioner 25 – A, Meeting 25, agenda item: n/a)

In other meetings, commissioners noted difficulties with transforming data into what Ackoff and Dammann would consider to be information or evidence, i.e. commissioners could not use it to answer questions or support decision-making, for example when looking at a Quarterly Patient Experience Report,[M22] data on LD health checks,[M24] or primary care data:

'In terms of the issue of data. I think this does come back to capacity and capability of networks to do anything with it. So just giving people data is desperately unhelpful. There is, nothing happens because you've got data,

you have to have data with a view to asking a question which you have asked, and for which a potential solution is possible.[M23] **(Commissioner 23 – A, Meeting 23, agenda item: Primary Care Performance Matrix)**

4.2.3.4 CMO 25: data champion

Table 37 CMO 25

CMO across evidence sources:
Synthesis Having a data champion within the commissioning team support and promote the usage of data in commissioning decisions (C) can increase the usage of data (O) because the data champion can increase engagement and persuade people to use data (M)
Interviews Having a data champion within the commissioning team support and promote the usage of data in commissioning decisions (C) can increase the usage of data (O) because the data champion can increase engagement and persuade people to use data (M) **and because commissioners are more receptive to communication about the importance of data if it comes from a team member (M)**
Meetings Silence (CMO not present)

Central to the concept of the data champion is the substantive theory that champions influence others to support their projects and ideas.[260] A champion's form of

persuasion employs a variety of influence techniques, such as selling, rationality, enthusiasm, and making personal appeals to other individuals for their assistance.[260] Champions can have a passion and motivation for their project.[260] The adoption of an innovation by individuals in an organisation is more likely if key individuals in their social networks are willing to support the innovation.[261]

In the synthesis, a data champion could be someone who championed a piece of work related to data,[48] a person responsible for maintaining or providing a service related to data,[262] or someone who encouraged people to use a certain data tool.[131] The data champion had the potential to trigger commitment[262] or champion data in more practical ways such as emphasising certain aspects of data that are relevant to certain audiences.[131]

The interviewees confirmed the utility of data champions, who employed methods to facilitate the usage of data that solved issues mentioned in other CMOs, such as data overload or difficulties interpreting data, by e.g. assembling key data for other commissioners who lacked the time to do so, disseminating data, collating data from GP practice searches and 'giving headlines,' and pulling together data libraries.[CI1,4,6,17-19,22, EI1,2,4,5]A data champion was an unofficial role, with interviewees either describing someone they considered to be a data champion, or describing themselves as one.

Two interviewees[CI1,19] said it was important for the data champion be part of the commissioning team rather than an outside. If the data champion was part of the commission team, commissioners became receptive to messages about the data's importance:

'I think actually you need a kind of data champion within the commissioning group. That's how I think it sort of has to come from them a bit. I, our team, can't really impose ourselves onto existing teams. There sort of needs to be a champion within the team that that is like, "data's important." We need to bring these in, these people in sooner.'[CI1] **(Commissioner interview 1, Population Health and Finance Manager)**

4.2.3.5 CMO 26: skills

Table 38 CMO 26

CMO across evidence sources:
Synthesis When commissioners lack the skills to analyse and interpret data (C) they cannot understand and draw insights from data for commissioning decisions (O) because of the knowledge gap (M)
Interviews When commissioners lack the skills to analyse and interpret data (C) they cannot understand and draw insights from data for commissioning decisions (O) because of the knowledge gap (M)
Meetings Silence (CMO not present)

A real or perceived lack of skills to undertake data analysis was cited as a key issue and barrier to using data in commissioning decisions.[43,128,139,208,219,220,223,224,233,237,246,256,263-271] Examples included challenges interpreting the data to 'sense check' if it matched reality,[265] challenges doing cost-utility calculations,[246] and difficulty using population-based data for epidemiological models.[223] Commissioners were described as 'well-intentioned' users of evidence,[43] and an increase in skills was associated with a desire to explore data further and undertake further data analysis,[266] suggesting that commissioners' use of data could be increased if their skills were strengthened. A controlled before and after study in nine CCGs sought evaluate whether access to an evidence briefing service would improve the use of research evidence by commissioners, but concluded that there a lack of skills or knowledge could be inhibiting this:

> 'Both baseline and follow-up data suggest that commissioners are well intentioned ad hoc users of research evidence and that they work in a setting where there is a lack of systems and processes to do this routinely. This suggests a knowledge and skills gap that this study has not addressed.'[43]

Interviewees confirmed the CMO.[CI7,16,17, EI1,4,5] One interviewee stated the commissioners had variable skill levels,[EI5] and another believed that commissioners weren't generally trained to understand and use data.[CI7]

4.2.3.6 CMO 27: commissioners' selective usage of data

Table 39 CMO 27

CMO across evidence sources:

Synthesis

If commissioners want to persuade others about their commissioning proposals (C) they may (selectively) use data to support their proposals (O) due to a perception that they are a form of evidence that are 'objective' and can increase the legitimacy of proposals (M)

Interviews

If commissioners want to persuade others about their commissioning proposals (C) they may (selectively) use data to support their proposals (O) due to a perception that they are a form of evidence that are 'objective' and can increase the legitimacy of proposals (M)

Meetings

If commissioners want to persuade **or reassure** others about their commissioning proposals (C) ~~they may (selectively) use data to support their proposals (O) due to a perception that it is a form of evidence that is 'objective' and can increase the legitimacy of proposals (M)~~ **they may stress that these are based on data (O) since commissioners believe data are useful to advocate and justify their proposals (M)**

Several studies described commissioners using data as a source of evidence to persuade others and justify proposals. Commissioners used data to support proposals because it had the potential to provide an investment decision with 'objectivity' and transparency, justifiability and legitimacy to multiple stakeholders,[190] helped frame discussions with providers[256] and could provide a more robust case for a committee that was not convinced of a pilot's efficacy.[51] In one study, GPs stated

they wanted ‘proper data’ to support their knowledge, and that although frontline knowledge was useful for guiding commissioning decisions, it was not enough on its own.[203]

In the documents reviewed, examples of this included the selective (rather than systematic) use of evidence to construct internal business cases,[209] public health data used to support and legitimise emerging commissioning plans (as opposed to driving them from the outset),[10] instances of ‘gaming’ evidence to support decisions that had already been taken,[272] and ‘retro-fitting’ data based on what people wanted to do.[210]

This CMO was partially shaped by Weiss’s substantive theory of the political model of research utilisation. Weiss states that the constellation of interests around a policy issue can predetermine the positions of decision makers.[129] Research can be used and selected to support a predetermined position, giving advocates a position of confidence and a better edge in a debate.[129] In this theory, distortion and misinterpretation of findings are illegitimate, but a person who finds the conclusions of research supportive can use it to bolster support and convince waverers.[129]

Several interviewees confirmed the CMO from the synthesis,[CI1,7,9,14, EI1,4,5 PPII,2,3] describing observations of data being used post hoc (or ignoring data if it did not tell them the ‘right’ answer) to help justify what they wanted to do, e.g.:

> *‘Things that happen on the other side I think are, that they don’t use data and information the way that it should be and it, the data can be used to support something that or can be sort of, I guess, displayed in a way, presented in a way that supports something that might not necessarily be true. You can kind*

of select a piece of evidence rather than providing all of the evidence. [CI1]

(Commissioner interview 1, Population Health and Finance Manager)

A similar CMO was developed based on evidence from one meeting, however here commissioners stressed that proposals were based on data to persuade and reassure others: when discussing a LES, a commissioner presented a report seeking approval for a new model of delivery in Primary Care, stating:

'This is something that the team have been working through this hasn't been done just from a management perspective so to give the committee that reassurance: this has very much been driven through looking at the data with partners that we've been working with around population health. [M18]

(Commissioner 18 – A, Meeting 18, agenda item: primary care strategic priorities)

This suggests that data may be considered a highly persuasive form of evidence among commissioners, and that commissioning proposals may be more likely to be implemented if commissioners can show they are based on data.

4.2.3.7 CMO 28: moral imperative without data

Table 40 CMO 28

CMO across evidence sources:
Synthesis
Silence (CMO not present)
Interviews

If commissioners believe they have a moral imperative to commission a service (C) they may do so even if there is an absence of evidence (including data) (O) because they think it is the right thing to do (M)

Meetings

Silence (CMO not present)

One commissioner stated that they sometimes commissioned services even where there was an absence of evidence, since they believed that it was the morally correct thing to do so:

> *'However, morally it seemed to be the right thing to do so I started thinking about whether there was some commission-, some services that should be commissioned in the absence of overwhelming evidence because morally it seemed the right thing to do…'*[Cl13] **(Commissioner interview 13, Chair, clinical commissioner (GP))**

4.2.3.8 CMO 29: resistance to data 'forced' onto commissioners

Table 41 CMO 29

CMO across evidence sources:

Synthesis:

Silence (CMO not present)

Interviews:

If commissioners perceive data to be 'forced' upon them (C) or it is not introduced in a

palatable way (C) commissioners may disengage from the data (M) or perceive the data to be flawed and/or activity look for flaws or loopholes in the data (M) making them less inclined to use the data (O)

Meetings:

Silence (CMO not present)

Interviewees stated that a perception that data was 'forced' upon them led to disengagement and ultimately them being less likely to use them.[CI3,4] Both interviewees talked about RightCare data, which an interviewee criticised as having a 'bad rap' in the local area because of the way it was introduced, which they critiqued as having received insufficient thought, leading to a disconnect with commissioners.[CI4] The same interviewee described people keenly searching for flaws in the RightCare data:

> *'…RightCare was a methodology that was being pushed on us from, from a central perspective as well and it was used as very crudely as benchmarking which in order to identify many tens of millions of pounds worth of savings without doing the bit about bringing in clinicians with you…it drove a lot of people to be, to be what's, I can't think of the right word really but almost dis-interpreting the data i.e. finding where the loopholes were, why it was wrong…rather than, rather than kind of trusting the data and, you know, it's just endless energy just making it incorrect as it were, justifying why it wasn't right….'*[CI4] **(Commissioner interview 14, Deputy Director of Finance for a CCG)**

The second interviewee concurred that RightCare had been 'pushed very hard' by the NHS, and that despite the resources invested into it, the data hadn't made a difference, and that:

> *'That didn't go anywhere because people could not understand the data and argue about it forever.'*[CI3] **(Commissioner interview 3, GP, has held multiple commissioning roles including medicines commissioning)**

4.2.3.9 CMO 30: lack of capacity to analyse data

Table 42 CMO 30

CMO across evidence sources:
Synthesis
Silence (CMO not present)
Interviews
If commissioners lack capacity to do data analysis (C) they will not be able to use the data (O) because of time and resource constraints (M)
Meetings
Silence (CMO not present)

Interviewees described a context of lacking capacity inhibiting the use of data.[CI3, EI2] The reasons for this included a lack of time, competing demands, and a general level

of being overwhelmed by constraints, even though commissioners 'really wanted to look at data.'[CI3, EI2]

> *'Does anyone look at that data? No. No-one has the time, non-one prioritises it. So, the data's being produced by practices. In fact, I personally set up a comprehensive diabetes data collection as part of our local diabetes contract. No-one has looked at that data for years. It's another scandal.'*[CI3]
> **(Commissioner interview 3, GP, has held multiple commissioning roles including medicines commissioning)**

4.2.3.10 CMO 31: trusting data source

Table 43 CMO 31

CMO across evidence sources:
Synthesis:
Silence (CMO not present)
Interviews:
If commissioners trust the source/producers of data (C) they will be more likely to use the data (O) because they think the data are credible (M)
Meetings:
Silence (CMO not present)

Trusting the source of data or their owner increased commissioners' belief that data were credible, in turn making them more likely to use the data.[CI1,4,6,12] One interviewee contrasted a risk stratification tool from an external party with a tool built by 'primary care themselves,' stating that the latter were more acceptable to making change happen.[C12] They further stated:

> *'I think it's not that we don't trust the national data but if we're gonna make a difference locally it's useful to have your own data and trust the source…'*[C12] **(Commissioner interview 12, Associate Director)**

One interviewee lauded Open Prescribing, which was 'led by clinicians' and being from a 'good data source' facilitated the data's usage:

> *'It's up to date, it's user friendly, that's why I think we tend to look at it and in a lot of ways because it's driven by pharmacists who understand what are the things that we need to know…'*[CI4] **(Commissioner interview 4, Deputy Director of Finance for a CCG)**

4.2.3.11 CMO 32: belief that data are incorrectly recorded

Table 44 CMO 32

CMO across evidence sources:
Synthesis
Silence (CMO not present)
Interviews

Silence (CMO not present)

Meetings

If commissioners believe data are incorrect due to the way clinicians record them (C) and they believe this is driven by a lack of knowledge or capabilities (C) they may work with clinicians to improve their data coding and documentation (O) because they think this is a useful way to improve the quality of data (M)

In meetings, commissioners sometimes had access to data they thought were incorrect due to the manner in which clinicians coded, documented or reported data.[M17,21,38,45] This related to different types of data, including data on influenza vaccination uptake, Safeguard Incident and Risk Management System (SIRMS) reporting or data on A&E attendances. The errors in the data were presumed to be due to gaps in knowledge or capabilities, and commissioners believed that offering clinicians help and support was a good way to improve the quality of data. For example, commissioners discussed the SIRMS reporting data, which showed large variations between practices, assumed to be driven by differences in reporting rather than actual differences in incidents.[M21,38] Due to a perception that this may have been driven by a perception of the process offering little return, the commissioners discussed that practices should be encouraged to do more reporting, and shown why this is important to improve the recording and therefore the quality of the data:

> *'…if you look at the variation across the CCG well there is huge variation and there are some practices that don't seem to report any incidents at all and I'm sure that's not because they don't have any incidents. So are we taking some*

action with those practices or encouraging them to do more reporting? I was also wondering are CQC interested in those figures, do they look at the SIRMS reporting and practices and would they have an interest in practice that that don't do that.' **(Commissioner 38 – A, Meeting 38, agenda item: quality report)**

'Because I think with any incident reporting it can become a bit of…a kind of perception of a lot of process and very little return. So I think the one thing I would absolutely be pushing is that we show the difference that it makes by reporting incidents and really starting to encourage more of the lessons learned and why it makes a difference and why it's important.'
(Commissioner 21 – A, Meeting 21, Agenda item: Primary Care Quality Report)

4.2.4 Conceptual category: interpersonal relationships with and perceptions of external providers

External providers are any organisation who provide commissioners with data and/or data analysis including NHS organisations such as Commissioning Support Units (CSUs), academic partners, and private firms such as consultancies and analytics providers. The relationships commissioners had with these external providers influenced how data were used.

4.2.4.1 CMO 33: perceptions of external providers' capability and/or skills

Table 45 CMO 33

CMO across evidence sources:
Synthesis If commissioners perceive external support to be able to provide different or new skills (C) commissioners will be more inclined to use the data and outputs they produce (O) because they are perceived as novel and useful (M)
Interviews If commissioners perceive external support to be able to provide different or new skills, **data, or additional capacity** (C) commissioners will be more inclined to use the data and outputs they produce (O) because they are perceived as novel and useful (M) **and the commissioners believe this is a worthwhile financial investment (M)**
Meetings Silence (CMO not present)

A context of external providers having skills commissioners did not have (or perhaps did not want to utilise) and applying these skills to data analysis enabled commissioners to have access to insights they could not have produced, which they found useful. Commissioners were positive about external providers who had strong analytical skills and felt this was a key strength.[131,210] These new analytical skills included e.g. risk stratification techniques that allowed commissioners to better understand and model levels of demand for health services.[139,273] One commissioner noted that external providers could be more motivated to look at data than NHS staff

were, and felt that external analysts were more interested in understanding what data meant.[131]

In the interviews, commissioners critiqued external support perceived to not offer any novel skills, which was also a poor financial investment:

> *'There are enough information sources, all that they do basically is take that and crunch it into a more readable report and you pay a lot of money for it…'*[CI21] **(Commissioner interview 21, leadership/management role)**

> *'This is a bit of a cynical view but all, all they do is, is kind of suck the information out of you and then present it back to you in a different way.'*[CI4] **(Commissioner interview 4, Deputy Director of Finance for a CCG)**

On the flipside, commissioners were receptive to working with external support perceived to have skills commissioners did not, including 'telling commissioners what they needed to know,' being quicker and more efficient and data analysis than commissioners were, and offering a 'fresh pair of eyes.'[CI9,12,20, EI6]

A new point raised in the interviews was that external support could provide not only to novel skills, but also novel (or 'better') data.[CI9] In additional, several interviewees[CI4,11,13] perceived external support to be helpful if they could take on tasks related to data analysis that commissioners did not have time or capacity for:

> *'It's kind of a bit of a necessity because we don't have the capacity to do big data analysis all of the time….and so, sometimes you have to buy in the expertise to do that.'*[CI4] **(Commissioner interview 4, Deputy Director of Finance for a CCG)**

4.2.4.2 CMO 34: collaboration and co-production with external providers

Table 46 CMO 34

CMO across evidence sources:
Synthesis When external providers understand the data needs of commissioners (C) and they can 'co-produce' the data (analysis) (C) commissioners are more likely to use their outputs (O), because they are relevant and useful (M)
Interviews When external providers understand the data needs of commissioners (C) and they can 'co-produce' the data (analysis) (C) commissioners are more likely to use their outputs (O), because they are relevant and useful (M)
Meetings Silence (CMO not present)

Where commissioners and external providers worked on data production and analysis collaboratively in a way that aligned with the principles of coproduction (commissioners and external providers have an active and equal relationship, active involvement of the commissioners in the design of services, dialogue between the commissioners and external providers), commissioners appeared more inclined to use the outputs. Positive examples of this included involving stakeholders (alongside end users) in the development of a dashboard related to antibiotic prescribing,

thereby helping to increase the validity of the tool by incorporating feedback throughout the design process[206] and a co-designed (with external consultants) 'toolkit' for integrated commissioning containing data for planning and delivering integrated care.[274] Collaborations also worked well when commissioners 'took the lead' with external providers supporting them: for example, in a PCT, a commercial company assisted with data analysis and helped build a dashboard tool, but the PCT maintained ownership of the build of the tool with the commercial company providing advice throughout the process – this meant the tool was tailored to what the PCT wanted to use it for, resulting in successful implementation.[131]

On the other hand, instances where there was a lack of coproduction and collaborative working between external providers and commissioners tended to produce less useful outputs, often because commissioners appeared unable to adequately communicate their needs to external providers who in turn could not understand commissioners' needs. As described in a study about the use of external consultants working with NHS healthcare commissioners:

> *I think what would be really useful is somebody from [external provider] to work with the strategic [commissioning] lead and maybe myself to actually think about the best way to use it to get the maximum results. So do we just look at COPD? Do we look at diabetes? Is there something that we can do with the tool that would give us a really quick win?* (NHS project manager, Kourtney)[130]

In a study on PBC consortia in PCTs, the PCT Information Departments repeatedly supplied data to commissioners, but the data were consistently considered

unsatisfactory or unusable by the commissioners in meetings – however, this may have been driven by a lack of shared understanding or sensemaking between the users and providers of information, who lacked a collective sense about what the data should be used for.[275] Similar challenges arose in instances where there was a lack of collaboration between commissioners and external providers, including commissioners critiquing the data provided by a CSU where there was a perceived lack of understanding between what the CSU provided and what commissioners wanted,[276] and a software tool created for the NHS by an external provider which was critiqued by a primary care commissioner who said they had been 'given' the tool and had to figure out how to apply it – this tool eventually only had limited impact on informing commissioning, with the study authors suggesting the data may have been used more if the external providers and commissioners had worked more closely together.[130]

One interviewee agreed that having a disconnect between the external producers and users of data could lead to disengagement because people did not understand how to use the outputs:

> *'There is a gender and decision-making bias from a bottom level as well because people feel ostracised, ignored, stepped around, diminished by the process…They see it go up there. They see something impossible come down and they don't pick it up and they don't engage.'*[CI8] **(Commissioner interview 8, Former Director of Commissioning for a CCG)**

An expert agreed that collaboration and co-production between commissioners and external providers could work well and facilitate the usage of data, a potential

limitation of the ‘collaborative, high trust-based approach’ was that there could be turnover, with people moving onto other roles, causing disruption.[EI1]

The theory of coproduction originally referred to the development of more responsive, personalised public services through ‘the joint working of people who are not in the same organisation to produce goods or services.’[277] Users of goods and services are active agents and not merely passive subjects or recipients of services, and there is a degree of equality in the relations between users and professionals, with users’ knowledge and experience being valued on a par with that of professionals.[278] The producers of services can incorporate the expertise and knowledge of the people who use services, and involve them in a process or dialogue of service design.[279] Service users’ participation in service design can lead to their needs being better met than if they were simply passive recipients of services.[278]

4.2.4.3 CMO 35: relationships with external providers

Table 47 CMO 35

CMO across evidence sources:
Synthesis
When commissioners can develop satisfactory relationships with the external providers of data (analysis) (C) commissioners are more likely to use data resulting from these relationships and collaborations (O) because the data produced are credible (M)

Interviews

When commissioners can develop satisfactory relationships with the external providers of data (analysis) (C) commissioners are more likely to use data resulting from these relationships and collaborations (O) because the data produced are credible (M)

Meetings

Silence (CMO not present)

Commissioners who developed relationships with the external providers of data (analysis) they perceived to be satisfactory (as evidenced by feelings of trust, closeness, cohesion, etc.) were more likely to use the data provided by the external providers. Feelings of trust meant that commissioners were able to 'to accept negative as well as positive results.'[237] Several studies noted how a lack of trust eventually led commissioners to be suspicious and disregardful of external providers' outputs: in one study, a commissioner said they did not trust any of the 'big consultancies' and that they did not believe their data was any better than what the NHS could provide, and that a trusting relationship was a prerequisite to using the data.[131] Another study described a difficult working relationship that led to a lack of respect and trust, thereby making it less likely the external providers' outputs would feed into decision making.[210] A lack of trust and respect between a CCG and external Business Information staff in a CSU made the working relationship between the CCG and the CSU difficult and meant that the opinions of the CSU were less respected, making it more difficult to use the outputs.[210]

Two studies also suggested that the closeness and duration of the relationships played a role facilitating the usage of data. The 'arm's length' nature of the

relationship between CSUs and CCGs was described as making it challenging to build the relationships required to make the best use of data available.[203] In another study, a CSU analyst had a long-standing and close relationship with commissioners at a CCG, and because of this long-standing relationship, the analyst was not seen as a threat when requesting plans or making suggestions.[131]

Interviewees[CI12,19, EI1,5] confirmed this CMO:

> *'…when people worked closely together for example when the external organisation had somebody sitting in the organisation working with them and chatting with them and really understanding what the concerns were that that made it better and also made what they said more trustworthy and more acceptable to the people using it…'*[EI5] **(Expert interview 5, academic at a university)**

4.2.4.4 CMO 36: external, principal – agent problem

Table 48 CMO 36

CMO across evidence sources: Synthesis In a context where there is a real or perceived divergence of interest (C) or information asymmetry between commissioners and external providers of data (analysis) (C) this may trigger feelings of mistrust among commissioners (M) which may make them less likely to use the data (O)

Interviews

In a context where there is a real or perceived divergence of interest (C) or information asymmetry between commissioners and external providers of data (analysis) (C) this may trigger feelings of mistrust among commissioners (M) which may make them less likely to use the data (O)

Meetings

Silence (CMO not present)

Several studies mentioned a real or perceived divergence of interest between commissioners and the external providers of data (analysis): in one, a commissioner was sceptical about data from a drug company because they felt there might be a divergence of interest since the drug company was 'driving a product.'[246] In another study, a commissioning manager and an information manager looked at data together and discussed and analysed exceptions together and developed a relationship, thereby increasing information symmetry.[240] Another commissioner voiced articulated that commercial providers might take advantage of commissioners and that data that were superficially appealing could be nonsensical, as the commercial providers prioritised earning money.[131]

The substantive theory the 'principal-agent problem' helped inform this CMO. The principal–agent relationship involves two parties exchanging resources – the principal disposes of resources to an agent, who accepts the resources and is willing to further the interests of the principal (e.g. the principal may give the agent money in

exchange for the agent's skills).[280] However, there is a risk that the agent may 'cheat' or 'shirk' if they have an informational advantage vis-à-vis the principal, i.e. the principal doesn't know for sure if the agent will really do their best when they take on tasks on the principal's behalf.[280] In addition, there is the risk of a potential *divergence of interest* between the principal and the agent, and that the principal cannot ensure that the agent will act in the principal's interest.[281] The principal–agent relationship typically involves information asymmetries: information as to whether the agent is in fact acting so as to achieve the principal's aims is available to the agent but not the principal.[281]

Interviewees[CI3,5,13,14, EI1] confirmed this, stating that if there was a perception that external providers of data (analysis) had a divergence of interest, commissioners became mistrustful of working with them. Interviewees described external consultancies like this, with one noting that external firms were not affected by the advice they provide, and that they can 'move on.'[CI14] Some described the perceived 'vested interests' of some consultancies:

> *'management consultancy firms have a vested interest in two things, change itself, and also, making you as an organisation incapable of sorting your own problems out…'*[CI13] ***(Commissioner interview 13, Chair, clinical commissioner (GP))***

> *'they don't actually have an interest in improving the system I suggest. They have interest in earning money producing glossy reports with colourful graphs which don't usually add very much to the direction of travel'*[CI3]

(Commissioner interview 3, GP, has held multiple commissioning roles including medicines commissioning)

On the other hand, one interviewee described working with a CSU who was perceived to be 'more impartial' as an example of a successful external collaboration.[EI1]

4.2.4.5 CMO 37 assessments of external providers' knowledge of the NHS

Table 49 CMO 37

CMO across evidence sources:
Synthesis:
Silence (CMO not present)
Interviews:
If commissioners believe external support lack expertise and knowledge about the NHS (C) they will view their data (analysis) as less useful and valid (M) making them less likely to use the data (analysis) they provide (O)
Meetings:
Silence (CMO not present)

Interviewees[CI4,14,22] voiced concerns about external providers' knowledge of the NHS – this included thinking that consultancies might take data 'at face value,' leading them to make (incorrect) assumptions that could only be avoided by having worked in the NHS, or that external 'experts' were not really experts:

> *'So yes, somebody coming in to actually help you to work out your problems and you solve your problems works but I remembered yes, there was a lot of consultancy work at the beginning of CCGs and PCT days and it was highly ineffectual….it was actually a good way of throwing money at something and then and then finding that it did not fix the problem. The trouble with experts, they're often not experts. They often haven't actually worked in the field.'*[CI14]
>
> **(Commissioner interview 14, clinical commissioner (GP))**

4.3. Analysis of CMOs across evidence sources

Table 4.43 summarises how the CMOs compare across the evidence sources. There were no instances of disagreements or dissonance across the evidence sources. Seven CMOs converged across all the evidence sources, and seven CMOs converged between the synthesis and interviews but were not found in the meeting evidence. The meeting evidence contained one new CMO not present in the interviews or synthesis, whereas the interview evidence contained six new CMOs not present in the other evidence sources.

Table 50 Comparison of CMOs across evidence sources

Comparison of findings between synthesis, interviews, and meetings	CMOs	Sum
Convergence of CMOs between all three evidence sources	CMOs, 4, 9, 11, 19, 23, 24	6
Convergence between synthesis and interviews, silence (no evidence) in meetings	CMOs 2, 17, 18, 26, 34, 35, 36	7
CMO present in interviews only	CMOs 6, 28, 29, 30, 31, 37	6
CMO present in synthesis, complementary findings in interviews, silence in meetings	CMOs 1, 14, 22, 25, 33	5
CMO present in synthesis, complementary findings in interviews and meetings	CMOs 7, 10, 21	3
Convergence between synthesis and meetings, complementary findings in interviews	CMOs 12, 15, 16	3
Convergence between synthesis and interviews, complementary findings in meetings	CMOs 13, 20, 27, 3	4
CMO present in the synthesis only	CMO 5, 8	2
CMO present in meetings only	CMO 32	1
Total		**37**

In line with other realist doctoral research[186] comparing silence, agreement, etc. between CMOs, I will not provide a detailed analysis of why every single CMO was not present in every evidence source. Instead, I will present general possible explanations that could explain why some CMOs were silent in some evidence sources, and why there were 'only' complementary findings in others:

- The Hawthorne Effect: this states that people may alter their behaviour when they are aware they are being observed, which can lead to increased compliance, productivity or adherence to protocol.[282] This may help explain why there was the highest number of silent CMOs in the meetings. It is

plausible that commissioners, knowing they were being recorded, would not want to make critical statements about external providers of data analysis, or the contexts that made them less likely to use data, be these personal characteristics (such as having difficulty understanding the data) or not knowing which data to prioritise.

- Timings: the evidence from the meetings was the most recent and covered the shortest time period, stemming from 2020 – 2022, whereas the evidence from the synthesis and interviews spanned several decades. This could mean that some CMOs present in the interviews and/or synthesis but not the meetings are no longer topical, or that, had the meeting evidence spanned a larger time period, there would have been less 'silence' in the meeting evidence. In addition, all the meetings took place during the COVID-19 pandemic, meaning that commissioners had to focus on responding to the pandemic, e.g. COVID-19 vaccines, potentially at the expense of more 'typical' commissioning activities. However, some of the studies in the synthesis collected primary data by observing meetings, meaning evidence from older meetings was at least indirectly analysed.
- Remote research: due to the ongoing COVID-19 pandemic, all evidence gathering was remote. Video interviews differ from in-person interviews since they can suffer from poor synchronisation, resulting in less fluid conversations, less transmission of nonverbal cues, and the fact that the visualisation of the other person is limited to their upper body.[283] A study comparing video and in-person interviews with people suffering from irritable bowel syndrome found that in-person interviews were 'marginally superior'

since interviewees said more, suggesting in-person interviews generated a greater depth of discussion.[284] This means interviewees might have shared more information had I completed in-person interviews, since building rapport in online interviews can be more difficult and therefore lead to less open discussions. This could explain why some CMOs were present in the synthesis only, or only partially present in interviews.

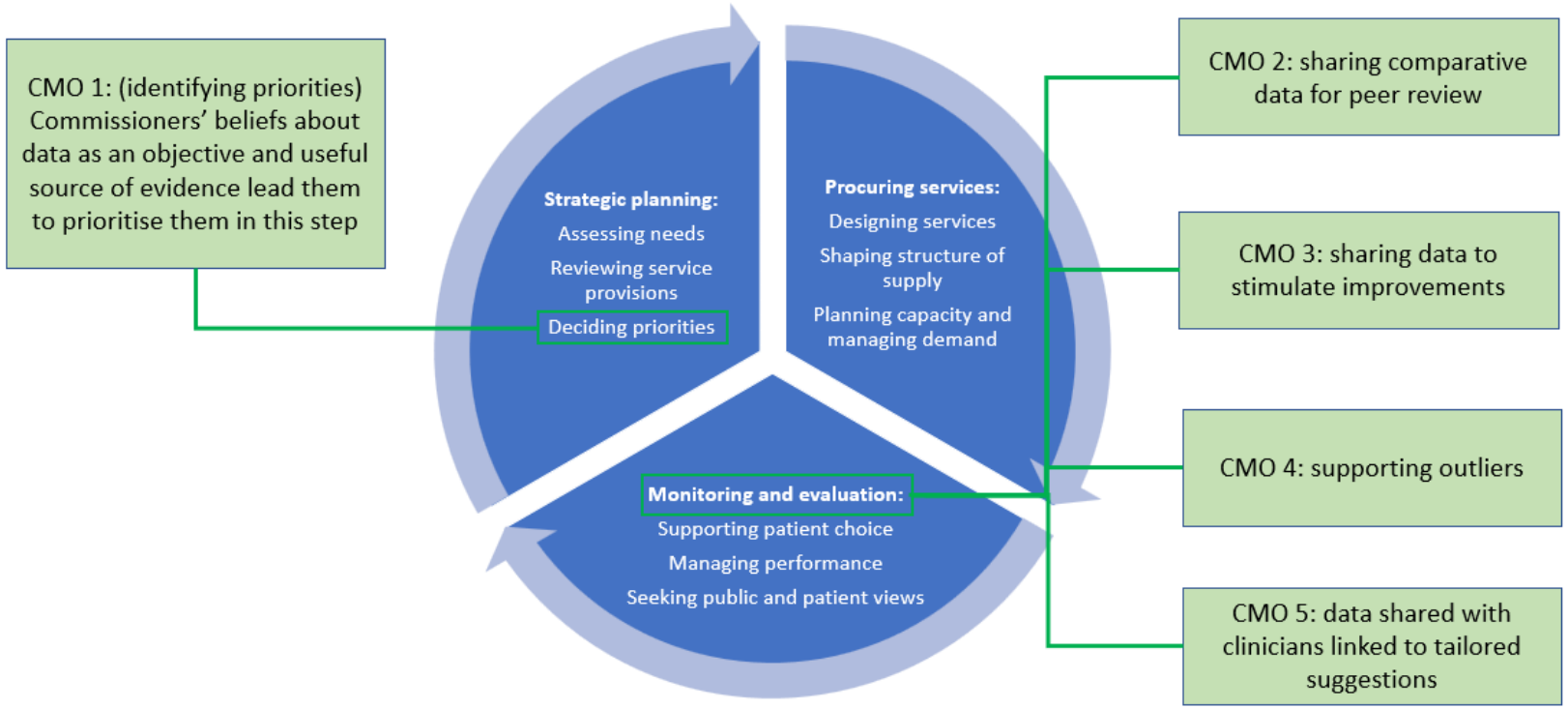
- Scope of evidence: it was not possible to gather and synthesise the entirety of any of the three evidence sources. It is possible that some instances of silence or complementary findings are simply due to the non-exhaustive nature of the evidence gathered.

4.4. Final programme theory

After synthesising the literature on data in commissioning and the evidence from two primary data sources, the developed CMOs represent the final programme theory. They are summarised graphically on the following pages. My principal findings are as follows. Commissioners use data not only as a 'passive' source of evidence to draw on when making commissioning decisions, but also actively as a tool with the aim of stimulating improvements. The first conceptual category (steps of the commissioning cycle) (figure 3) contains five CMOs related to specific commissioning activities: in CMOs 1, commissioners' beliefs about data as an objective and useful source of data led them to prioritise them as a source of evidence when identifying commissioning priorities. Four CMOs are broadly related to the 'monitoring and evaluation' step of the commissioning cycle: in CMOs 2 and 3, commissioners used data as a tool to stimulate improvements by sharing

comparative data on peers to stimulate learning, peer pressure, and improvement (CMO 2) and by sharing data on ‘poor’ performers due to a perception that sharing data could empower service providers or clinicians to develop solutions, in some cases by triggering discomfort (CMO 3). In CMO 4, when commissioners accessed data indicating potential for improvement and commissioners suspected clinicians needed help to achieve this, they offered clinicians help and support with the aim of maintaining positive relationships. In CMO 5, commissioners aimed to improve clinician performance by sharing data in a way that was easy to understand and linked to tailored suggestions for action with the aim of increasing clinician engagement.

Figure 3: Programme theory: Conceptual category: steps of the commissioning cycle



The contexts in the CMOs in the three other conceptual categories generally related to factors or contexts that promoted or inhibited the use of data. Figures 4-6 show the contexts promoting and inhibiting the usage of data in each of the three remaining conceptual categories, the mechanisms triggered, and outcomes achieved, as well as how these CMOs are linked to the potential incomplete CMO configurations in the initial programme theory, each of which could be further developed into a ‘full’ CMO. The key findings for each conceptual category are as follows – for ease of presentation, the wording of the CMOs has been simplified and the findings across the evidence sources combined.

Figure 4: Programme theory: Conceptual category: characteristics of data


Initial PT: Potential incomplete CMO configurations
Factors/contexts promoting the usage of data
Mechanisms
Outcomes: Usage of (certain) data more likely
CMO 6: data indicating potential cost saving without compromising patient care
Belief that data indicate a valid way to making savings
CMO 7: commissioners wish to better understand data
Perception that qualitative information provide a deeper/more comprehensive understanding/increase validity of data
Supplementation of data with qualitative information
Local data may trump national data in certain contexts
CMO 8: commissioners' beliefs that data available do not reflect unique local circumstances
Perception that local data can better serve local needs
Prioritisation of gathering/analysis of local data or contextualise data to local circumstances
CMO 9: access to data on health inequalities
Perception that data are useful to achieving moral/policy objectives
Combining data sources facilitates their usage
CMO 10: access to combined datasets
Perception that data are useful, facilitate integrated commissioning, reassurance that data are comprehensive, and enable a fuller understanding of the patient journey
Commissioners more inclined to use data
Data's format may facilitate or hinder their usage
CMO 14: key pieces of data are presented in a succinct, visually appealing, easily digestible manner to commissioners
Increased engagement and understanding
CMO 15: data that show trends and developments over time
Perception that data are useful and provide a less 'distorted' view
Commissioners more inclined to use data linked to financial implications
CMO 18: commissioners can access data linked to cost implications
Evidence aligns with what commissioners want to understand and a priority they consider important
Increased inclination to use data, prioritisation of data over other forms of evidence
CMO 19: commissioners access data they can segment and 'drill down' in
Ability to create targeted and tailored commissioning decisions
Untimely data unlikely to be used
CMO 20: commissioners have data that are considered 'real-time' or recent
Trust that data reflect the current situation, and perceived utility for providing immediate support/speedy decision making
CMO 21: commissioners only have access to flawed or imperfect data they understand the limitations of, and/or have a commissioning issue they urgently want to address, and/or feel an obligation to use data
Ability to adapt data in ways that are useful, belief that using these data is better than no data at all, reduced fear that others might 'reject' data
Try to use data as much as possible

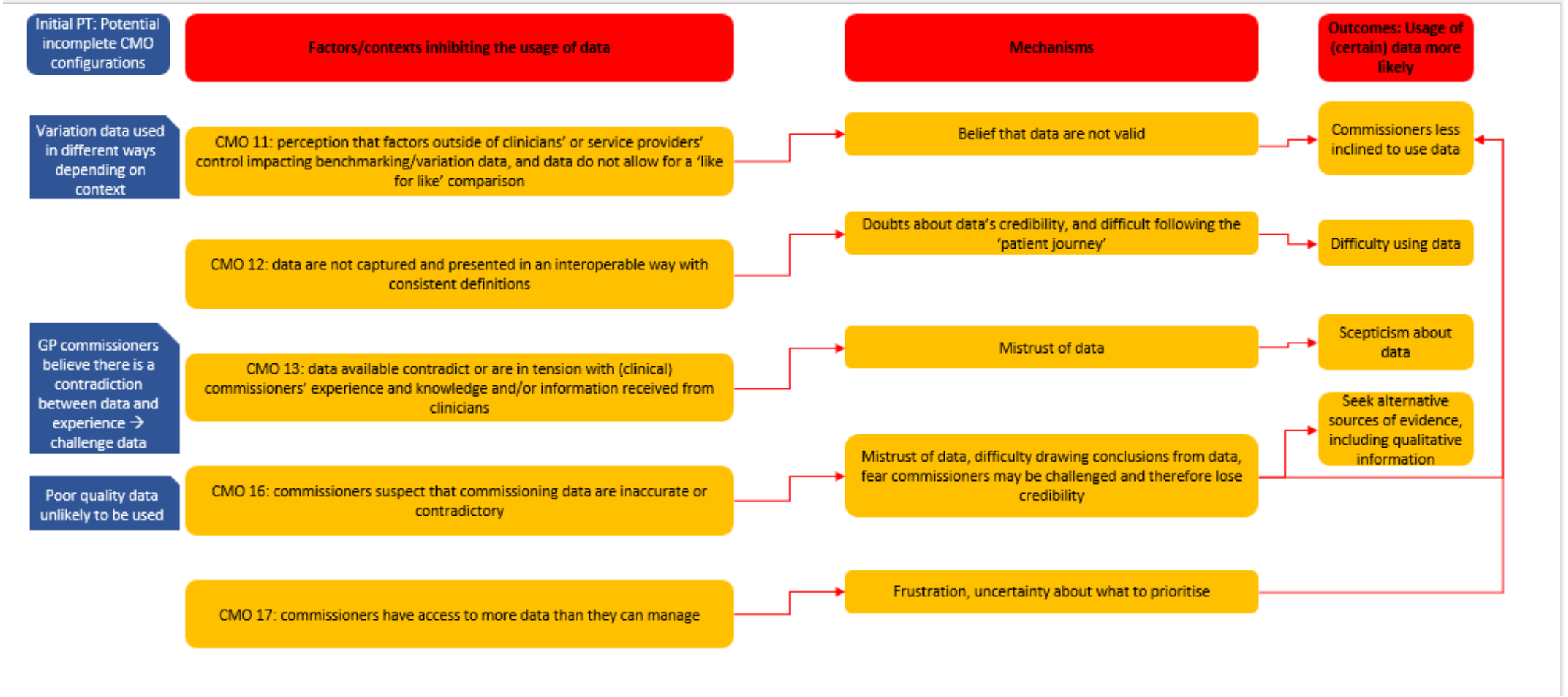
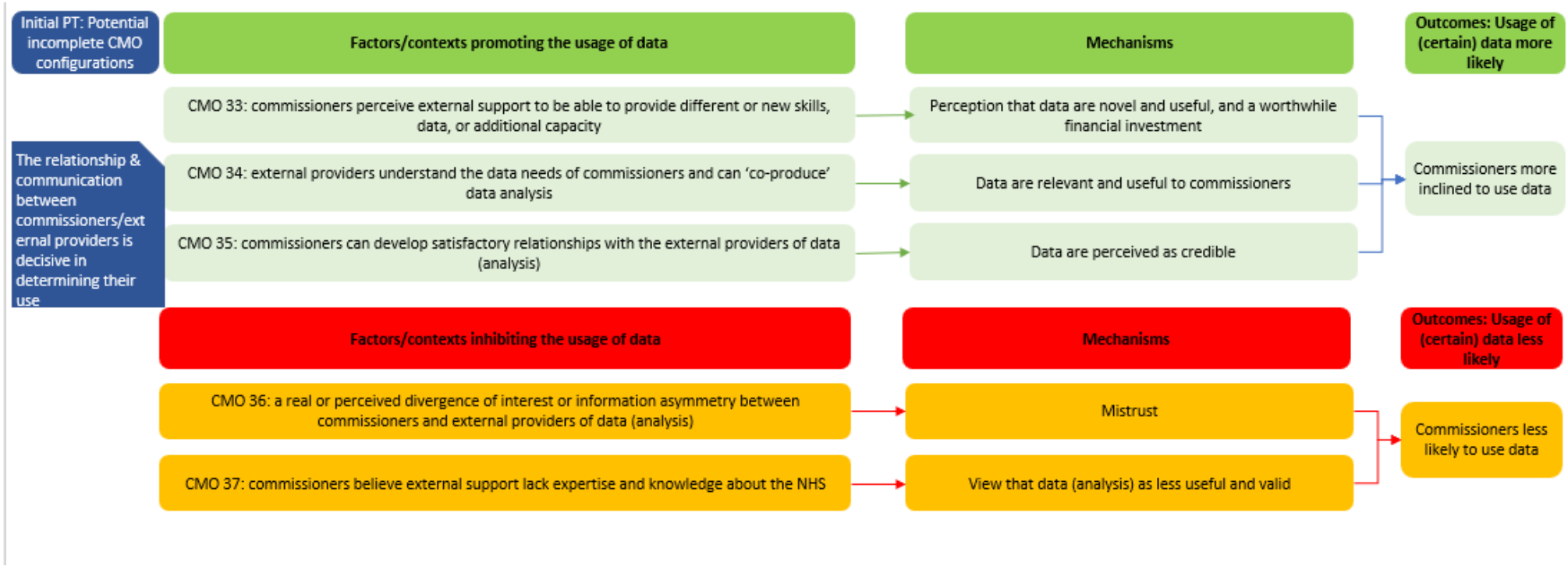

Initial PT: Potential incomplete CMO configurations
Factors/contexts inhibiting the usage of data
Mechanisms
Outcomes: Usage of (certain) data more likely
Variation data used in different ways depending on context
CMO 11: perception that factors outside of clinicians' or service providers' control impacting benchmarking/variation data, and data do not allow for a 'like for like' comparison
Belief that data are not valid
Commissioners less inclined to use data
CMO 12: data are not captured and presented in an interoperable way with consistent definitions
Doubts about data's credibility, and difficult following the 'patient journey'
Difficulty using data
GP commissioners believe there is a contradiction between data and experience → challenge data
CMO 13: data available contradict or are in tension with (clinical) commissioners' experience and knowledge and/or information received from clinicians
Mistrust of data
Scepticism about data
Poor quality data unlikely to be used
CMO 16: commissioners suspect that commissioning data are inaccurate or contradictory
Mistrust of data, difficulty drawing conclusions from data, fear commissioners may be challenged and therefore lose credibility
Seek alternative sources of evidence, including qualitative information
CMO 17: commissioners have access to more data than they can manage
Frustration, uncertainty about what to prioritise

Figure 5: Conceptual category: commissioners' capabilities, roles, perceptions, and intentions


Initial PT: Potential incomplete CMO configurations
Factors/contexts promoting the usage of data
Mechanisms
Outcomes: Usage of (certain) data more likely
CMO 23: commissioners can choose and select data and metrics they use
Data are perceived as meaningful and valid
Increased engagement and inclination to use data
CMO 25: a data champion supports and promotes the usage of data
The data champion can increase engagement and persuade others to use data, and commissioners are more receptive to communication about the importance of data if it comes from a team member
Commissioners may use data selectively
CMO 27: commissioners want to persuade/reassure others about their commissioning proposals
Perception that data are a useful and 'objective' source of evidence that can increase the legitimacy of proposals
Commissioners (selectively) use data to support proposals, or stress that these are based on data
CMO 31: commissioners trust the source/producers of data
Belief that data are credible
Commissioners more likely to use data
Factors/contexts inhibiting the usage of data
Mechanisms
Outcomes: Usage of (certain) data less likely
Commissioners feel pressure to make financial savings
CMO 22: commissioners are subjected to financial pressures
Perceived obligations
Make decisions based on little to no evidence (including data), sometimes including data related to potential (clinical) improvements
Commissioners cannot operationalise data → cannot use them
CMO 24: commissioners' inability to transformation data into 'information'
Inability to operationalise data
Commissioners less inclined to use data
CMO 26: commissioners lack the skills to analyse and interpret data
Knowledge gap
Commissioners cannot understand data and draw insights
CMO 28: commissioners believe they have a moral imperative to commission a service
Belief that they are doing the right thing
Choice to commission service even if there is an absence of evidence (including data)
CMO 29: commissioners' perception that data are being 'forced' upon them
Disengagement, perception that data are flawed, attempt to look for flaws/loopholes in data
CMO 30: commissioners lack capacity to do data analysis
Time and resource constraints
Inability to use data
CMO 32: commissioners believe data are incorrect due to the way clinicians record them
Belief about a useful way to improve the quality of data
Commissioners work with clinicians to improve their data coding and documentation

Figure 6: Conceptual category: interpersonal relationships with and perceptions of external providers



5. Discussion and conclusions

In this chapter, I begin by summarising the aims and key findings of my DPhil. I then provide an overview of the existing (realist and non-realist) literature on evidence use in policy-making, and show that although my findings parallel many of the existing themes in the literature, my thesis makes a novel contribution due to the specificity of the research questions, the amount of evidence analysed and the depth and breadth of contexts identified related to data use, and novel insights around how commissioners use and adapt 'imperfect' data, and utilise data as a tool and warrant for decision-making. I then provide reflections on reflexivity, i.e. how my background and characteristics may have impacted the findings. I consider the strengths and limitations of my work and reflect on how the COVID-19 pandemic impacted my research and the challenges and benefits this afforded me. Finally, I conclude the chapter by making policy recommendations as well as suggestions for future research.

5.1 Summary of results

This thesis has aimed to understand how and why commissioners use data to inform commissioning and the outcomes this leads to, as well as which factors and contexts promote and inhibit the usage of data in commissioning decisions. By synthesising a large amount of information from three evidence sources using a realist approach, I have found that commissioners are often well-intentioned users of data, but face a range of challenges that inhibit their ability to do so. These include commissioners' capabilities, such as whether they have the skills to analyse data, as well as broader

factors such as financial pressures and frustrations stemming from the way in which data are presented and given to commissioners. Commissioners have developed a range of technique to utilise the often imperfect data they have access to, and are proactive in attempting to improve the quality of data they access. In addition, this thesis has found that commissioners value data as a form of 'rational' or 'objective' evidence (potentially mirroring broader societal beliefs about the supremacy of quantitative evidence) and that data can be employed as a warrant when attempting to convince others of commissioning decisions, as well as a tool to stimulate improvements amongst clinicians. If the NHS is to continue to promote and increase the amount of data used in commissioning, commissioners, who have a detailed understanding of data, should have greater involvement in designing and implementing policies related to data use.

5.2 Comparison and contribution to the existing literature

My realist synthesis sought to synthesise the literature on the usage of data as a form of evidence in primary care commissioning. Very few of the included studies focussed exclusively on the usage of data as a form of evidence and/or solely on primary care commissioning, with the majority investigating the use of multiple forms of evidence or research in commissioning and/or specific organisations such as CCGs or PCTs responsible for commissioning numerous types of care. I attempted to synthesise the portions of the studies focussing on the usage of data specifically in primary care commissioning (although, as outlined in previous chapters, some commissioning activities and pathways span multiple types of care e.g. primary and secondary care). In addition, although a small number of studies included in my

systematic review did focus on the usage of data in primary care commissioning, these typically focused on describing or evaluating a specific intervention or commissioning activity, e.g. evaluating the effects of an intervention on opioid prescribing in primary care,[205,225] or assessing how general practice data could be used for needs assessments and health planning in a London district.[225] In contrast, this thesis has gathered a large amount of primary data from a wide range of interviews and commissioning meetings across England, covering commissioning activities across many locations, thereby making a novel contribution to studying data usage in primary care commissioning in terms of the depth and breadth of primary data gathered, as well as by forming new CMOs based on findings from interviews and meetings. Due to the unprecedented situation of having access to meeting recordings, I was able to transcribe meetings and complete a detailed analysis of the spoken content in meetings. In addition, to the best of my knowledge, I have created the first systematic review focussed specifically on the usage of data as a form of evidence in primary care commissioning.

I will now reflect on how my findings compare to adjacent fields of research, namely realist and non-realist research on evidence use in policy-making.

5.2.1. Overview of realist research on evidence use in policy-making

Several pieces of realist research have investigated how policy-makers use evidence in different policy-making contexts, including a realist scoping review on interventions aiming to increase policy-makers' capacity to use research in various countries,[149] a realist evaluation of a multi-component intervention trial to increase the capacity of health policymakers to use research in Australia,[150] a realist evaluation of an

intervention in France aiming to increase the usage of evidence in the field of health promotion,[285] and a realist evaluation on evidence use in an equity focused health impact assessment in Canada.[286] Many of the mechanisms identified that promoted and inhibited the usage of evidence (or data) in these studies were similar to those identified in this DPhil. In addition, in line with the findings of my DPhil, the actual, 'objective' characteristics of evidence were only one factor impacting its usage, with individual, environmental, and organisational factors also playing a role in the usage of data and evidence.

A novel contribution of my thesis is the nuance and complexity of outcomes identified. In the aforementioned studies, the outcomes identified related to evidence tended to be binary, i.e. focussing on whether evidence was used or not. The study of the intervention in France identified only the usage of scientific knowledge or data as an outcome, attempting to elucidate the contexts that facilitated this. Similarly, the Canadian study focused on a limited set of outcomes such as the extent to which evidence was sought (including changes over time), types of evidence used, and outcomes related to prospective evidence use (e.g. positive attitudinal changes). The scoping review and evaluations of the intervention to increase the use of research in Australia focussed on outcomes related to evidence use as well as process effects (proximal impacts influencing intervention outcomes i.e. something that could facilitate the use of evidence) such as self-reported skills increases. Although some of the outcomes identified in this thesis were also 'binary' (e.g. relating to contexts and mechanisms making the usage of data more or less likely), some of the outcomes provided new insights and nuances, such as highlighting how commissioners could use and adapt 'imperfect' data or work with clinicians to

improve the quality of data. In addition, a contribution made by this thesis to the existing realist research is showing how data can be used both as a tool (rather than solely a source of evidence) to improve commissioning outcomes, but also as a warrant for decision-making.

5.2.2 Overview of non-realist research on evidence use in policy-making

Non-realist studies of evidence-based decision making in policy have correspondingly found that the usage of evidence in decision-making is a complex, context dependent process, and that evidence is often underutilised. A systematic review on the use of research evidence in public health decision making across multiple countries found that the process of decision making varied widely in different settings, and contextual factors impacted the usage of research.[287] A systematic review on the use of evidence in decision-making on health care innovations within acute and primary care found that evidence use was impacted by a range of contexts, barriers, and facilitators including varying preferences for evidence by professional group and factors such as time and resource pressures.[272] A study about healthcare-commissioning organisations found that healthcare decision-makers operated in complex environments with nebulous goals, time pressures, and problems, which could be inimical to 'rational', repeatable, step-by-step decisions based solely on scientific knowledge.[42] The findings of this thesis have confirmed many of the findings of non-realist research on evidence use in policy-making, e.g. that a gulf or disconnect between decision-makers and researchers (or evidence providers) can prevent evidence from being used,[287] or that a lack of time and resources inhibits evidence use.[272] Non-realist research on evidence-use in policy-

making has concluded that there is a need for context specific research about the best approaches for incorporating research evidence into decision making, [287] and that further research is needed on how and why different types of evidence are used in decision-making.[272] This thesis has built on this by investigating in more detail the contexts impacting the usage of data, as well as providing insights on specific types of data such as variation data or combined datasets. Understanding the latter is particularly pertinent in light of the transition to more integrated commissioning in ICBs and ICSs, since these will have to commission 'joined up' health and care services across e.g. secondary and primary care.

5.3 Reflexivity

Reflexivity encourages the researcher to consider how their social position, experiences, and demographic traits compare to and intersect with those of their research participants, thereby increasing the credibility of their findings.[288,289] A researcher's position as an insider or outsider, the extent to which they and the research participants share experiences, and the 'power distance' between them can impact the collection and analysis of data, and should be made known to readers.[288,289]

I am not a clinician and have never been an employee of the NHS, although I have worked on projects with NHS stakeholders, as well as projects for local councils developing commissioning strategies. Despite having some prior exposure to the NHS, I perceived myself to be an outsider to the commissioning process studying insiders (commissioners) who were sharing their views and experiences with me. This outsider status can confer advantages: when interviewers and interviewees are

similar, feelings of comparison, competition, and intimidation may arise.[289] I did not perceive any feelings of defensiveness or competition from the interviewees, and felt that some of them were relieved to be able to communicate certain frustrations around using data to someone outside of the NHS. Several interviewees asked me if they had comprehensively answered my questions or given me enough information. Whilst I appreciated this thoughtfulness and willingness to share experiences, this strengthened my perception that the relationship between us was more akin to an insider/outsider relationship than one of equals. I sometimes felt too timid to probe certain responses or pose more controversial follow-up questions, especially pertaining to CMOs that suggested commissioners might use data selectively or not at all in certain contexts. In retrospect, had I had the courage to do so, I may have elicited more nuanced information.

This status as an outsider may also impacted the development of CMOs from the synthesis and meeting evidence. Given that most of the studies in the synthesis and all the meeting minutes were atheoretical, I had to draw on substantive theories from the broader literature to facilitate the development of CMOs. Had I had more first-hand experience of commissioning prior to commencing my analysis, I may have been able to identify an even wider range of relevant substantive theories to facilitate CMO development or identify the ones I did use earlier on in my analysis.

Finally, as a white, middle-class woman with a university degree, I am aware that I share at least some demographic traits with many NHS commissioners. Although I cannot comment on the interviewees' demographics since they did not consent to

sharing this information, I did not feel that my demographics disadvantaged me during the interviews.

5.4 Strengths, limitations, and the impact of the COVID-19 pandemic

The key strengths of this thesis are its novel contribution to the literature, the large amount of evidence gathered and analysed, as well as the degree of agreement (and resulting increased validity) between the findings across the three evidence sources. I collected and analysed a large amount of secondary and primary data across three sources: although not every CMO was (fully) present in every evidence source, no CMOs contradicted each other and had a reasonable amount of overlap across the evidence sources, thereby strengthening the CMOs' validity.

The fact that I could only access remote meeting content meant I was able to draw on evidence from a larger number of CCGs than I would have been able to had I attended in-person meetings. This came at the expense of being able to observe the nuances and dynamics of in-person meetings, and I believe commissioners may have been less open and unfiltered than in in-person meetings knowing their contributions were being recorded and made publicly available. All the meeting recordings are from 2020-2022, meaning much meeting time was dedicated to managing the effects of the pandemic. This was an unprecedented situation during which exceptional commissioning decisions were being made, including attempting to administer COVID-19 vaccines, and may not have been representative of 'typical' commissioning meetings.

It is impossible to reflect on the strengths and limitations of this study without also reflecting on the impact of the COVID-19 pandemic. The COVID-19 pandemic

restricted my research in several ways: commissioners, along with the entire NHS workforce, faced considerable stress and pressure during this time, leading some (prospective) interviewees to cancel or delay interviews, or ask to truncate their interviews. Some interviews were complicated by the challenges inherent to remote working, including slow internet connections, poor phone reception, and family members interrupting interviews. Whilst remote interviews are cheaper and quicker to complete than in-person interviews, I felt it was more challenging to establish rapport and trust in remote conversations. This means that had I completed in person interviews in a non-pandemic context, I may have been able to gather 'deeper' interview findings by establishing more in-person rapport. Whilst the expert interviews were useful in providing additional validity and detail for CMO formation, several expert interviewees noted that it had been several years since they studied evidence use in commissioning, and that they could not remember certain details. Finally, I caught COVID-19 in the spring of 2022, which left me with lingering long-COVID symptoms and feelings of exhaustion and 'brain fog' while writing up my thesis and completing my analysis.

A challenge I encountered throughout this thesis was linking existing substantive theories to CMOs to enhance and facilitate their development. Whilst some realist projects relate to interventions that have been theorised and researchers are able to source one or more substantive theories to develop their initial programme theory, this is not always possible and therefore the initial programme theory is more general and not (yet) in a realist format.[122,123] I only found atheoretical papers whilst developing my initial programme theory, and even during the realist synthesis only a few of the included papers were linked to substantive theories. I therefore tried to

use multiple approaches to identify substantive theories, as outlined previous chapters, but it was still not possible to link every CMO to a substantive theory.

In retrospect, it may have been possible to draw on additional substantive theories in fields adjacent to evidence use in policy-making to develop the initial programme theory. Some realist reviews on evidence use in policy-making have drawn on broader theoretical frameworks such as evidence-to-practice, knowledge translation, and diffusion of innovation frameworks to facilitate theory development.[149,285,286] After retrospectively considering some of these broader theoretical frameworks (e.g. the knowledge-to-action process[290] and the diffusion of innovations framework[261]), I believe that although they could potentially have been used to inform the initial, high-level programme theory, their utility for the development of individual CMOs may have been limited due to their high level of abstraction and the fact that they are not specific to evidence use in policy-making, even if many of the contexts and mechanisms in these theories resonate with the CMOs I developed.

5.5 Conclusions

5.5.1 Policy recommendations

Based on my findings, I have developed several policy recommendations that could potentially facilitate and increase commissioners' usage of data:

- Increase collaboration with the external providers of data: when commissioners can develop relationships and collaborate with the external providers of data, they can better communicate their needs and co-produce relevant evidence. This can also facilitate feelings of trust and make

commissioners less wary of external providers' motivations, thereby making them more likely to use the data.

- Increase collaboration between commissioners and the NHS's data providers: commissioners sometimes mistrusted the source of data, or resented the way data were 'forced' upon them. If commissioners were more closely involved in the creation and dissemination of data such as RightCare or the Atlas of Variation, the data could be more tailored to commissioners' needs and commissioners could potentially perceive certain data as less of an 'imposition.'
- Implement a 'data champion' in each commissioning team: commissioners are receptive to messaging and leadership from their peers around data. Having a data champion in their commissioning team who they view as an equal can increase engagement with data.
- Improve the availability of integrated data: with the advent of ICSs, integrated, combined datasets (including combining data across different types of care e.g. primary and secondary care as well as data on social determinants of health e.g. inequality data) are more important than ever. Being able to see the full 'patient journey' and considering how non-medical factors impact health outcomes can enable customised commissioning.
- Give commissioners access to manipulatable datasets: commissioners want access to data they can perform their own analyses on, rather than static data.
- Define skills and competencies for commissioners and provide training: commissioners come from a wide range of academic backgrounds prior work

experiences. Some commissioners are not confident in their capability to analyse data. Defining the skills that are expected of commissioners in terms of data analysis and providing training could increase engagement with data.

5.5.2 Future research directions

I stopped gathering primary data around mid-2022, just as CCGs were being dissolved and replaced by ICSs, with ICBs taking on a range of commissioning responsibilities, including primary care services.[33] Several recent NHS policy documents have outlined the importance of ICSs using data to deliver population health improvements, address health inequalities, and develop ICS-wide fully linked datasets from data that are still mostly held separately by individual services and their commissioners.[291] Future research could test the applicability of the CMOs developed in this study to ICSs, in particular CMO 10 (combined datasets) and CMO 12 (interoperability), and refine and develop new CMOs as required.

Given the government's 'National Data Strategy' and its commitment to using 'better data' for 'better decision making' to deliver more tailored and efficient policies and make savings,[292] future research could assess, compare and contrast how similar areas of policy-making (such as social care, education, or the justice system) use data to inform the planning and commissioning of services. By identifying common barriers and facilitators to using data in policy-making as well as methods to overcoming the concomitant challenges, policy-makers could learn from each other and improve their own practice of evidence use.

5.5.3 Concluding thoughts

Considering the NHS's increased commitment to and investment in using data to inform commissioning, combined with the financial pressures stemming from an ageing population facing increasingly complex health challenges, the need to understand how data can be used effectively to inform commissioning is greater than ever. I have completed a study based on large amounts of evidence to analyse and synthesise how the use of data is working in practice. One encouraging finding from this research is that commissioners generally do value data as a source of evidence to inform their decision-making, perceiving data to be 'rational,' persuasive, and useful if presented and used correctly. By using realist approaches, I have presented the case for a fresh perspective on the myriad contexts that can facilitate and hinder the usage of data: although commissioners are often eager and willing to use data to inform commissioning decisions, they face a range of challenges that can impede their use, and addressing these will require changes to be made to the data themselves, as well as the manner in which data are presented and shared with commissioners.

In addition, increasing commissioners' trust in the quality of data and strengthening their relationships with and trust in those who provide them with data can facilitate the data's usage. There is potentially a disconnect between how NHS policy-makers and providers of data believe the data are used in commissioning and how they are actually used, and greater collaboration and exchange between them and commissioners could facilitate the usage of data.

Appendices

Appendix 2.1: Ethics approval documents

Appendix 2.1.1. Patient Information Sheet for commissioners

NUFFIELD DEPARTMENT OF
PRIMARY CARE
HEALTH SCIENCES
Medical Sciences Division

Nuffield Department of Primary Care Health Sciences
Radcliffe Primary Care Building, Radcliffe Observatory Quarter, Woodstock Rd, Oxford OX2 6GG

The usage of data within NHS primary care commissioning: a realist synthesis and evaluation

PARTICIPANT INFORMATION SHEET

Central University Research Ethics Committee (CUREC) Approval Reference: **R68193/RE001**

1. *Why is this research being conducted?*

The 2012 Health and Social Care Act and subsequent governmental health policies have mandated of the use of research and evidence as a core consideration in commissioning and stated that commissioners should be able to access and utilise data for commissioning planning and research. Despite the availability of an unprecedented amount of data (e.g. data on variations in healthcare utilisation and performance) and significant efforts to develop concomitant commissioning toolkits, there is limited understanding of how data is used to inform commissioning decisions.

Integrating more evidence into commissioning is a complex process and previous interventions suggest it is unlikely to be achieved solely through dissemination of evidence amongst commissioners or closer relationships between commissioners and researchers. Adjacent literature on bridging the "gap" between evidence and policy has identified numerous barriers e.g. a lack of skills amongst policy makers, but the process of the use of evidence by policy remains understudied. This research will help explore the underlying causes for the usage (or non-usage) of data in commissioning decisions.

The aim of this research is to explore the contexts that influence the usage of data within NHS primary care commissioning by asking:

- What are the underlying mechanisms to using data in primary care commissioning, in what contexts do they occur and how do they vary?
- Which contexts relate to which outcomes, and which contexts are more likely to result in data being used in commissioning decisions?

In this DPhil, data is defined as quantitative, statistical evidence.

2. *Why have I been invited to take part?*

You have been invited because you are a commissioner who has experience of using evidence in commissioning decisions. The researcher is looking to interview approximately 40 commissioners for this study.

To be eligible to take part, you must be:

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Radcliffe Primary Care Building, Radcliffe Observatory Quarter, Woodstock Rd, Oxford OX2 6GG

- willing and able to give informed consent for participation in the study
- Aged 18 years or above
- EITHER (i) currently working for the NHS in the area of primary care commissioning OR (ii) someone with previous experience of working for the NHS in the area of primary care commissioning

3. *Do I have to take part?*

No. You can ask questions about the research via email or a phone call before deciding whether to participate. If you do agree to participate, you may withdraw yourself from the study at any time, without giving a reason, by advising the researcher of this decision. There will be no negative consequences to you if you decide not to take part.

4. *What will happen to me if I take part in the research?*

If you are happy to take part in the research, you will be asked to schedule a remote interview, which will be completed via a phone or Microsoft Teams call. As of September 2020, University of Oxford research guidance states that all research must be conducted remotely where possible. Therefore, the interviews must be conducted remotely and there is no possibility to arrange face-to-face interviews.

When the interview starts, you will have the opportunity to ask any questions about the research. If you are still happy to take part, the interview will commence and be recorded on two secure devices (the interviewer will notify you before the recording commences). The interviewer will only take a voice (i.e. no video) recording. Prior to the interview, you will receive an email with a consent form which can be returned to the researcher via email. Alternatively, you can choose to complete an oral consent process prior to the interview.

The interview will last for approximately 60 minutes and we ask you to put aside this time, though it may be shorter (or longer) depending on how much you wish to say. You can also ask to pause or stop the interview at any time. We will be discussing how you currently utilise evidence, and in particular data, in commissioning decisions and what factors promote and inhibit this. If you or the researcher feel a follow up interview would be useful to promote a deeper understanding of your work, this can be arranged at the researcher's and your discretion.

The interviews will be audio-recorded and then professionally transcribed. The transcribed text will be de-identified from your personal data. If you do not wish to be audio recorded, the researcher can instead take notes during the interview. Following the interview, you may request to review the interview transcript, which can be shared via Microsoft 365 OneDrive for business. In line with University of Oxford guidance, you will be given the option to correct factual inaccuracies and request the removal of any information you feel could compromise your anonymity.

5. *Are there any potential risks in taking part?*

There are no specific preparatory requirements.

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To reduce potential risks, your data will be pseudonymised so that only your job title (e.g. Finance Manager or Data Analyst) is included in the research publications and a description of the CCG you belong to. It is likely that you will share some information about your professional experience during the interview, e.g. your education and for how long you have been working in commissioning. Following the interview, the recordings will be transferred to a secure, password protected computer.

6. *Are there any benefits in taking part?*

We hope that you will find this an interesting discussion which may involve useful reflection on your professional practice.

7. *Expenses and payments*

There will be no payment for taking part in this study.

8. *What happens to the data provided?*

The information you provide as part of the study is the **research data.** Any research data from which you can be identified (e.g. your name, email address, audio recording), is known as **personal data.**

We will minimise our use of personal data in the study as much as possible. **Personal data** will be stored confidentially on Nexus OneDrive for business.

The audio-recordings will be transcribed into text by professional transcribers. This text, along with any notes taken by the researcher during the interview will the form the **research data** which will be stored confidentially on secure, password protected University of Oxford computers. It will then be read, analysed and summarised using Microsoft Office and NVivo software.

The **research data** will be separated from your **personal data.** This means your name, email address and any other contact information will be held in a separate securely stored electronic document and given a numerical code which will then be used to label the **research data.** The content of what you say in the interview will not be published alongside any personal data (besides your role and a broad description of your CCG) in order to preserve your confidentiality.

The researcher, their supervisors and university-approved professional transcribers will have access to **personal data** and **research data**. Responsible members of the University of Oxford may be given access to data for monitoring and/or audit of the research. The audio recordings will be deleted as soon as they have been transcribed.

We would like your permission to use anonymous direct quotes. If you say anything during the interview which you would not like to be directly quoted, then you are free to say, and we will not do so.

All **research data** will be stored for at least 3 years after publication of the research. We will retain and store your **personal data** only as long as it is needed for the purposes of the study, after which time it will be deleted. The linkage data linking the research and personal data will stored on a secure, password protected network drive at the University of Oxford only as long as it is needed for the

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purposes of the study, after which time it will be deleted. Hard copies of your signed consent forms will be stored in a secure location for at least 3 years following the publication of the research. If oral consent has been given, a recording of the oral consent as well as the researcher record of oral consent will be stored in a secure location for at least 3 years following the publication of the research.

9. *Will the research be published?*

The research may be published in peer-reviewed journals and presented at scientific conferences. We would like to be able to use quotes linked to your job title and a broad description of your CCG in educational materials, e.g. conference presentations or on-line content.

The University of Oxford is committed to the dissemination of its research for the benefit of society and the economy and, in support of this commitment, has established an online archive of research materials. This archive includes digital copies of student theses successfully submitted as part of a University of Oxford postgraduate degree programme. Holding the archive online gives easy access for researchers to the full text of freely available theses, thereby increasing the likely impact and use of that research.

The research will be written up as a student's doctoral thesis. On successful submission of the thesis, it will be deposited both in print and online in the University archives to facilitate its use in future research. If so, the thesis will be openly accessible.

10. *Who is funding the research?*

This research is funded by an NIHR School for Primary Care Research studentship.

11. *Who has reviewed this study?*

This study has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee (Reference number: R68193/RE001).

12. *Who do I contact if I have a concern about the study or I wish to complain?*

If you have a concern about any aspect of this study, please speak to the researcher, Alexandra Jager [alexandra.jager@exeter.ox.ac.uk] or her supervisor Dr. Geoffrey Wong [geoffrey.wong@phc.ox.ac.uk] who will do their best to answer your query. The researcher should acknowledge your concern within 10 working days and give you an indication of how they intend to deal with it. If you remain unhappy or wish to make a formal complaint, please contact the relevant chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter in a reasonably expeditious manner:

Chair, **Medical Sciences Inter-Divisional Research Ethics Committee**; Email: ethics@medsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD

13. *Data Protection*

Nuffield Department of Primary Care Health Sciences
Radcliffe Primary Care Building, Radcliffe Observatory Quarter, Woodstock Rd, Oxford OX2 6GG

The University of Oxford is the data controller with respect to your personal data, and as such will determine how your personal data is used in the study.

The University will process your personal data for the purpose of the research outlined above. Research is a task that is performed in the public interest.

Further information about your rights with respect to your personal data is available from http://www.admin.ox.ac.uk/councilsec/compliance/gdpr/individualrights/.

14. *Further Information and Contact Details*

If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

Alexandra Jager

Nuffield Department of Primary Health Care Sciences,

Radcliffe Observatory Quarter,

Woodstock Road,

Oxford, OX2 6GG

alexandra.jager@exeter.ox.ac.uk

Appendix 2.1.2 Participant Information Sheet for expert interviews

UNIVERSITY OF OXFORD

NUFFIELD DEPARTMENT OF PRIMARY CARE HEALTH SCIENCES
Medical Sciences Division

Nuffield Department of Primary Care Health Sciences
Radcliffe Primary Care Building, Radcliffe Observatory Quarter, Woodstock Rd, Oxford OX2 6GG

The usage of data within NHS primary care commissioning: a realist synthesis and evaluation

PARTICIPANT INFORMATION SHEET

Central University Research Ethics Committee (CUREC) Approval Reference: **R68193/RE001**

1. ***Why is this research being conducted?***

The 2012 Health and Social Care Act and subsequent governmental health policies have mandated of the use of research and evidence as a core consideration in commissioning and stated that commissioners should be able to access and utilise data for commissioning planning and research. Despite the availability of an unprecedented amount of data (e.g. data on variations in healthcare utilisation and performance) and significant efforts to develop concomitant commissioning toolkits, there is limited understanding of how data is used to inform commissioning decisions.

Integrating more evidence into commissioning is a complex process and previous interventions suggest it is unlikely to be achieved solely through dissemination of evidence amongst commissioners or closer relationships between commissioners and researchers. Adjacent literature on bridging the "gap" between evidence and policy has identified numerous barriers e.g. a lack of skills amongst policy makers, but the process of the use of evidence by policy remains understudied. This research will help explore the underlying causes for the usage (or non-usage) of data in primary care commissioning decisions.

The aim of this research is to explore the contexts that influence the usage of data within NHS primary care commissioning by asking:

- What are the underlying mechanisms to using data in primary care commissioning, in what contexts do they occur and how do they vary?
- Which contexts relate to which outcomes, and which contexts are more likely to result in data being used in commissioning decisions?

In this DPhil, data is defined as quantitative, statistical evidence.

2. ***Why have I been invited to take part?***

You have been invited because you have conducted research on the usage of evidence in primary care commissioning. The researcher believes that consulting you on your expertise of this topic can help refine, strengthen, and validate the emerging findings of this research project. The researcher has thus far conducted primary (interviews with primary care commissioners and analysis of publicly available recordings of primary care commissioning meetings and minutes) and secondary research (a

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systematic realist review) on the usage of evidence use in primary care commissioning and developed hypotheses based on the outcomes of this research.

The researcher believes that presenting their emerging findings and hypotheses to a small number of researchers with expertise of evidence-based commissioning for comment and refinement will be beneficial since the researchers can offer the following novel insights which cannot be obtained from the data sources analysed thus far:

- They may have experience of observing and analysing primary care commissioning processes across a large range of organisations
- They may be able to provide insights on primary care commissioning processes as an "outsider" (in contrast to the commissioners interviewed who have provided insights on the usage of evidence in primary care commissioning as "insiders")
- They may have experience of applying theoretical frameworks or explanations to the usage of evidence in primary care commissioning that they can share with the researcher

To be eligible to take part, you must:

- Be willing and able to give informed consent for participation in the study
- Be aged 18 years or above
- Have experience of conducting research on the usage of evidence in primary care commissioning, evidenced through the publication of at least one peer-reviewed study on this subject
- Have experience of collecting and analysing some form of primary data in the field of evidence usage in primary care commissioning, e.g. through the observation of primary care commissioning meetings, interviews with primary care commissioners, etc.

3. ***Do I have to take part?***

No. You can ask questions about the research via email or a phone call before deciding whether to participate. If you do agree to participate, you may withdraw yourself from the study at any time, without giving a reason, by advising the researcher of this decision. There will be no negative consequences to you if you decide not to take part.

4. ***What will happen to me if I take part in the research?***

If you are happy to take part in the research, you will be asked to schedule a remote interview, which will be completed via a phone or Microsoft Teams call. As of September 2020, University of Oxford research guidance states that all research must be conducted remotely where possible. Therefore, the interviews must be conducted remotely and there is no possibility to arrange face-to-face interviews.

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Radcliffe Primary Care Building, Radcliffe Observatory Quarter, Woodstock Rd, Oxford OX2 6GG

When the interview starts, you will have the opportunity to ask any questions about the research. If you are still happy to take part, the interview will commence and be recorded on two secure devices (the interviewer will notify you before the recording commences). The interviewer will only take a voice (i.e. no video) recording. Prior to the interview, you will receive an email with a consent form which can be returned to the researcher via email. Alternatively, you can choose to complete an oral consent process prior to the interview.

The interview will last for approximately 45 minutes and we ask you to put aside this time, though it may be shorter (or longer) depending on how much you wish to say. You can also ask to pause or stop the interview at any time. We will be discussing the researcher's emerging findings and hypotheses on how primary care commissioners utilise data and evidence in decision making, and ask you to reflect on how this aligns with your observations and thoughts on the process.

The interviews will be audio-recorded and then professionally transcribed. The transcribed text will be de-identified from your personal data. If you do not wish to be audio recorded, the researcher can instead take notes during the interview. Following the interview, you may request to review the interview transcript, which can be shared via Microsoft 365 OneDrive for business. In line with University of Oxford guidance, you will be given the option to correct factual inaccuracies and request the removal of any information you feel could compromise your anonymity.

5. ***Are there any potential risks in taking part?***

There are no specific preparatory requirements.

To reduce potential risks, your data will be pseudonymised so that only your job title (e.g. researcher with knowledge of evidence based primary care commissioning) is included in the research publications. Following the interview, the recordings will be transferred to a secure, password protected computer.

6. ***Are there any benefits in taking part?***

We hope that you will find this an interesting discussion which may involve useful reflection on your professional practice.

7. ***Expenses and payments***

There will be no payment for taking part in this study.

8. ***What happens to the data provided?***

The information you provide as part of the study is the **research data.** Any research data from which you can be identified (e.g. your name, email address, audio recording), is known as **personal data.**

We will minimise our use of personal data in the study as much as possible. **Personal data** will be stored confidentially on Nexus OneDrive for business.

The audio-recordings will be transcribed into text by professional transcribers. This text, along with any notes taken by the researcher during the interview will the form the **research data** which will be stored confidentially on secure, password protected University of Oxford computers. It will then be read, analysed and summarised using Microsoft Office and NVivo software.

The **research data** will be separated from your **personal data.** This means your name, email address and any other contact information will be held in a separate securely stored electronic document and given a numerical code which will then be used to label the **research data.** The content of what you say in the interview will not be published alongside any personal data in order to preserve your confidentiality.

The researcher, their supervisors and university-approved professional transcribers will have access to **personal data** and **research data**. Responsible members of the University of Oxford may be given access to data for monitoring and/or audit of the research. The audio recordings will be deleted as soon as they have been transcribed.

We would like your permission to use anonymous direct quotes. If you say anything during the interview which you would not like to be directly quoted, then you are free to say, and we will not do so.

All **research data** will be stored for at least 3 years after publication of the research. We will retain and store your **personal data** only as long as it is needed for the purposes of the study, after which time it will be deleted. The linkage data linking the research and personal data will stored on a secure, password protected network drive at the University of Oxford only as long as it is needed for the purposes of the study, after which time it will be deleted. Hard copies of your signed consent forms will be stored in a secure location for at least 3 years following the publication of the research. If oral consent has been given, a recording of the oral consent as well as the researcher record of oral consent will be stored in a secure location for at least 3 years following the publication of the research.

9. ***Will the research be published?***

The research may be published in peer-reviewed journals and presented at scientific conferences. We would like to be able to use quotes linked to your job title in educational materials, e.g. conference presentations or on-line content.

The University of Oxford is committed to the dissemination of its research for the benefit of society and the economy and, in support of this commitment, has established an online archive of research materials. This archive includes digital copies of student theses successfully submitted as part of a University of Oxford postgraduate degree programme. Holding the archive online gives easy access for researchers to the full text of freely available theses, thereby increasing the likely impact and use of that research.

The research will be written up as a student's doctoral thesis. On successful submission of the thesis, it will be deposited both in print and online in the University archives to facilitate its use in future research. If so, the thesis will be openly accessible.

10. ***Who is funding the research?***

NUFFIELD DEPARTMENT OF PRIMARY CARE HEALTH SCIENCES
Medical Sciences Division
Nuffield Department of Primary Care Health Sciences
Radcliffe Primary Care Building, Radcliffe Observatory Quarter, Woodstock Rd, Oxford OX2 6GG
This research is funded by an NIHR School for Primary Care Research studentship.

11. ***Who has reviewed this study?***

This study has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee (Reference number: R68193/RE001).

12. ***Who do I contact if I have a concern about the study or I wish to complain?***

If you have a concern about any aspect of this study, please speak to the researcher, Alexandra Jager [alexandra.jager@exeter.ox.ac.uk] or her supervisor Dr. Geoffrey Wong [geoffrey.wong@phc.ox.ac.uk] who will do their best to answer your query. The researcher should acknowledge your concern within 10 working days and give you an indication of how they intend to deal with it. If you remain unhappy or wish to make a formal complaint, please contact the relevant chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter in a reasonably expeditious manner:

Chair, **Medical Sciences Inter-Divisional Research Ethics Committee**; Email: ethics@medsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD

13. ***Data Protection***

The University of Oxford is the data controller with respect to your personal data, and as such will determine how your personal data is used in the study.

The University will process your personal data for the purpose of the research outlined above. Research is a task that is performed in the public interest.

Further information about your rights with respect to your personal data is available from http://www.admin.ox.ac.uk/councilsec/compliance/gdpr/individualrights/.

14. ***Further Information and Contact Details***

If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

Alexandra Jager

Nuffield Department of Primary Health Care Sciences,

Radcliffe Observatory Quarter,

Woodstock Road,

Oxford, OX2 6GG

Appendix 2.1.3 Consent form

Nuffield Department of Primary Care Health Sciences, Radcliffe Primary Care Building, Radcliffe Observatory Quarter, Woodstock Rd, Oxford OX2 6GG

Dr. Geoffrey Wong
geoffrey.wong@phc.ox.ac.uk
Alexandra Jager [DPhil student]
Oxford University telephone number: 01865 289300
Oxford University e-mail: alexandra.jager@exeter.ox.ac.uk

PARTICIPANT CONSENT FORM

Central University Research Ethics Committee (CUREC) Approval Reference: R68193/RE001

The usage of data within NHS primary care commissioning: a realist synthesis and evaluation

Purpose of Study: to explore the contexts that influence the usage of data within NHS primary care commissioning by asking: (i) what are the underlying mechanisms related to using data in primary care commissioning, in what contexts do they occur and how do they vary? (ii) which contexts relate to which outcomes, and which contexts are more likely to result in data being used in commissioning decisions?

		Please initial each box
1	I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily	☐
2	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without any adverse consequences or penalty	☐
3	I understand that research data collected during the study may be looked at by authorised people outside the research team. I give permission for these individuals to access my data	☐
4	I understand that this project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee	☐
5	I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project	☐
6	I understand how this research will be written up and published	☐
7	I understand how to raise a concern or make a complaint	☐
8	I consent to being audio recorded	☐

9	I understand how audio recordings will be used in research outputs	☐
10a	I agree to the use of pseudonymised quotes in research outputs **OR**	☐
10b	I do not wish to be directly quoted	☐
11	I agree to take part in the study	☐

Name of Participant	dd / mm / yyyy Date	Signature
Name of person taking consent	dd / mm / yyyy Date	Signature

Appendix 3.1: database searches

Initial database search – March 2019

Grey literature searches – all searched in the spring of 2019			
Website	**Source name**	**Hits**	**Search strategy**
https://digital.nhs.uk/	NHS Digital	200	Go to the website for NHS Digital (https://digital.nhs.uk/) and enter the following search string in the box on the main page: commissioning AND (data OR surveillance OR insights OR intelligence) AND ("primary care" OR "primary health" OR "general practice") When it displays the search results, there is a box on the far left that says 'document type' - select "publications" here

http://www.opengrey.eu/	Open Grey	33	Go to http://www.opengrey.eu/ and enter the following search string: (NHS OR "national health service") AND (data OR surveillance OR insights OR intelligence) AND ("primary care" OR "primary health" OR "general practice")
https://www.tripdatabase.com/	TRIP Database	324	Go to the TRIP database (https://www.tripdatabase.com/) enter the following under search: commissioning AND primary care AND data AND NHS On the right hand side of the page, you will be able to select certain document types. Please select the following: Evidence-based synopses (284 documents), primary research (40 documents) (not key primary research, this is a separate category)

https://www.kingsfund.org.uk/	The King's Fund	71	Go to Google.co.uk, and type in the following search string: .pdf site:https://kingsfund.org.uk commissioning AND (data OR surveillance OR insights OR intelligence) AND ("primary care" OR "primary health" OR "general practice") This will search for PDFs (i.e. reports only), using Google to search the King's Fund site
https://www.evidence.nhs.uk/	NICE Evidence search	387	Search string: (NHS OR "national health service") AND (data OR insights OR intelligence) AND ("primary care" OR "primary health" OR "general practice") AND (commissioning). Filter: focusing on Area of interest - Commissioning and Management. It is not possible to export these files into Rayyan/Ref Works including the summary description, so I had to review them manually on the website. This hits may contain duplicates and included studies for full-text screening will be included under studies identified through hand-searching on the PRISMA diagram.

Database searches					
Database name	**Hits**	**Fields searched**	**Date searched**	**Search syntax**	**Notes**
CINAHL (Cumulative Index to Nursing and Allied Health Literature)	295	Abstract	30/03/2019	S1: AB (Data OR Insights OR Statistics OR Business Analy* OR business intelligence) Search modes - Boolean/Phrase S2: AB (NHS OR National Health Service OR Public Health England OR Department of Health OR English healthcare OR English Health Care) Search modes - Boolean/Phrase S3: AB(competitive tendering OR fundholding OR fund-holding OR strategic contracting OR strategic buying OR procurement OR purchas* OR contracting out OR gpfh OR Primary Care Groups OR PCG* OR Primary Care Trust* OR PCT* OR Clinical Commissioning Group* OR CCG* OR commissioning OR commissioner* OR Assessing needs OR reviewing service provisions OR deciding priorities OR designing services OR "shaping structure of supply" OR "planning capacity and managing demand" OR supporting patient choice OR managing performance OR "seeking public and patient views" OR Needs assessment OR planning OR Market management OR Market development OR decommissioning OR disinvestment OR performance management OR procuring services OR "monitoring and evaluation") Search modes - Boolean/Phrase S4: AB(Primary Care OR Primary healthcare OR Primary Health Care OR Primary Health-Care OR Primary Health OR phc OR general practi*) Final search: (S1 AND S2 AND S3 AND S4)	

Embase	1,710	Keyword (mp, mp,in. for NHS terms)	30/03/2019	(Primary Care or Primary healthcare or Primary Health Care or Primary Health-Care or Primary Health or phc or general practi*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] AND (Data or Insights or Statistics or Business Analy* or business intelligence).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] AND (NHS or National Health Service or Public Health England or Department of Health or English healthcare or English Health Care).mp,in. AND (competitive tendering or fundholding or fund-holding or strategic contracting or strategic buying or procurement or purchas* or contracting out or gpfh or Primary Care Groups or PCG* or Primary Care Trust* or PCT* or Clinical Commissioning Group* or CCG* or commissioning or commissioner* or Assessing needs or reviewing service provisions or deciding priorities or designing services or "shaping structure of supply" or "planning capacity and managing demand" or supporting patient choice or managing performance or "seeking public and patient views" or Needs assessment or planning or Market management or Market development or decommissioning or disinvestment or performance management or procuring services or "monitoring and evaluation").mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	

Health Management Information Consortium	678		30/03/2019	(Primary Care or Primary healthcare or Primary Health Care or Primary Health-Care or Primary Health or phc or general practi*).mp. AND (Data or Insights or Statistics or Business Analy* or business intelligence).mp. AND (NHS or National Health Service or Public Health England or Department of Health or English healthcare or English Health Care).mp. AND (competitive tendering or fundholding or fund-holding or strategic contracting or strategic buying or procurement or purchas* or contracting out or gpfh or Primary Care Groups or PCG* or Primary Care Trust* or PCT* or Clinical Commissioning Group* or CCG* or commissioning or commissioner* or Assessing needs or reviewing service provisions or deciding priorities or designing services or "shaping structure of supply" or "planning capacity and managing demand" or supporting patient choice or managing performance or "seeking public and patient views" or Needs assessment or planning or Market management or Market development or decommissioning or disinvestment or performance management or procuring services or "monitoring and evaluation").mp.	Search run by Nia Roberts on 28/03/2019 (students do not have access). Coverage of the database = HMIC Health Management Information Consortium 1979-January 2019
NIHR-HTA Database	25	Any field, HTA	30/03/2019	(data OR insights OR statistics) AND (nhs OR "national health service") AND ("primary care" OR "primary health" OR "primary healthcare" OR phc OR "general practi*") AND (commission* OR ccg OR need* OR demand* OR planning OR capaciy OR performance OR market OR decommission* OR disinvest* OR procur* OR monitor*)	

ProQuest Dissertations & Theses Global	339	Abstract	27/03/2019	S1 AND S2 AND S3 AND S4 S1 ab("Data" OR "Insights" OR "Statistics" OR "Business Analy*" OR "business intelligence") S2 ab(NHS OR "National Health Service" OR "Public Health England" OR "Department of Health" OR "English healthcare" OR "English Health Care") S3 ab("competitive tendering" OR fundholding OR fund-holding OR "strategic contracting" OR "strategic buying" OR procurement OR purchas* OR "contracting out" OR gpfh OR "Primary Care Groups" OR "PCG*" OR "Primary Care Trust*" OR "PCT*" OR "Clinical Commissioning Group*" OR "CCG*" OR "commissioning" OR commissioner* OR “Assessing needs" OR "reviewing service provisions" OR "deciding priorities" OR "designing services" OR "shaping structure of supply" OR "planning capacity and managing demand" OR "supporting patient choice" OR "managing performance" OR "seeking public and patient views" OR "Needs assessment" OR "planning" OR "Market management" OR "Market development" OR decommissioning OR disinvestment OR "performance management" OR "procuring services" OR "monitoring and evaluation") S4 ab("Primary Care" OR "Primary healthcare" OR "Primary Health Care" OR "Primary Health-Care" OR "Primary Health" OR phc OR "general practi*")	Limit applied is English only. All databases selected

Scopus	980	Title, abstract, key words	30/03/2019	(TITLE-ABS-KEY (nhs OR "National Health Service" OR "Public Health England" OR "Department of Health" OR "English healthcare" OR "English Health Care")) AND (TITLE-ABS-KEY ("competitive tendering" OR fundholding OR fund-holding OR "strategic contracting" OR "strategic buying" OR procurement OR purchas* OR "contracting out" OR gpfh OR "Primary Care Groups" OR "PCG*" OR "Primary Care Trust*" OR "PCT*" OR "Clinical Commissioning Group*" OR "CCG*" OR "commissioning" OR commissioner* OR "Assessing needs" OR "reviewing service provisions" OR "deciding priorities" OR "designing services" OR "shaping structure of supply" OR "planning capacity and managing demand" OR "supporting patient choice" OR "managing performance" OR "seeking public and patient views" OR "Needs assessment" OR "planning" OR "Market management" OR "Market development" OR decommissioning OR disinvestment OR "performance management" OR "procuring services" OR "monitoring and evaluation")) AND (TITLE-ABS-KEY ("Primary Care" OR "Primary healthcare" OR "Primary Health Care" OR "Primary Health-Care" OR "Primary Health" OR phc OR "general practi*")) AND (TITLE-ABS-KEY ("Data" OR "Insights" OR "Statistics" OR "Business Analy*" OR "business intelligence")) AND (LIMIT-TO (LANGUAGE , "English"))	
Web of Science	352	TS= Topic		(TS=("Data"OR"Insights"OR"Statistics"OR"Business Analy*"OR"business intelligence")) *AND* LANGUAGE: (English) AND (TS=(NHS OR "National Health Service" OR "Public Health England" OR "Department of Health" OR "English healthcare" OR "English Health Care")) AND LANGUAGE: (English) AND (TS=("competitive tendering" OR fundholding OR fund-holding OR "strategic contracting" OR "strategic buying" OR procurement OR purchas* OR "contracting out" OR gpfh OR "Primary Care Groups" OR "PCG*" OR "Primary Care Trust*" OR "PCT*" OR "Clinical Commissioning Group*" OR "CCG*" OR "commissioning" OR commissioner* OR “Assessing needs" OR "reviewing service provisions" OR "deciding priorities" OR "designing services" OR "shaping structure of supply" OR "planning capacity and managing demand" OR "supporting patient choice" OR "managing performance" OR "seeking public and patient views" OR "Needs assessment" OR "planning" OR "Market management" OR "Market development" OR decommissioning OR disinvestment OR "performance management" OR "procuring services" OR "monitoring and evaluation")) AND LANGUAGE: (English) AND (TS=("Primary Care" OR "Primary healthcare" OR "Primary Health Care" OR "Primary Health-Care" OR "Primary Health" OR phc OR "general practi*")) AND LANGUAGE: (English)	

Additional search – October 2019

Database	Search string	Fields searched	Results	Notes

CINAHL	"evidence based commissioning" OR "evidence-based commissioning"	Abstract	4	Search modes: Boolean/phrase
Embase	("evidence based commissioning" or "evidence-based commissioning").mp.	[mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	16	
ProQuest Dissertations & Theses Global	ab("evidence-based commissioning") OR ab("evidence based commissioning")	Abstract	2	
Scopus	TITLE-ABS-KEY ("evidence based commissioning") OR TITLE-ABS-KEY ("evidence-based commissioning")	Article title, Abstract, Keywords	16	

Web of Science	("evidence-based commissioning") OR ("evidence based commissioning")	Topic	8	
NIHR-HTA Database	("evidence-based commissioning") OR ("evidence based commissioning")	Any field	0	

Updated search – March 2022

Name of database	Date searched	Results	Fields searched	Query string
Scopus	02/03/2022	136	Title, abstract, key words	(TITLE-ABS-KEY ("Data" OR "Insights" OR "Statistics" OR "Business Analy*" OR "business intelligence") AND TITLE-ABS-KEY (nhs OR "National Health Service" OR "Public Health England" OR "Department of Health" OR "English healthcare" OR "English Health Care") AND TITLE-ABS-KEY ("competitive tendering" OR fundholding OR fund-holding OR "strategic contracting" OR "strategic buying" OR procurement OR purchas* OR "contracting out" OR gpfh OR "Primary Care Groups" OR "PCG*" OR "Primary Care Trust*" OR "PCT*" OR "Clinical Commissioning Group*" OR "CCG*" OR "commissioning" OR commissioner* OR "Assessing needs" OR "reviewing service provisions" OR "deciding priorities" OR "designing services" OR "shaping structure of supply" OR "planning capacity

				and managing demand" OR "supporting patient choice" OR "managing performance" OR "seeking public and patient views" OR "Needs assessment" OR "planning" OR "Market management" OR "Market development" OR decommissioning OR disinvestment OR "performance management" OR "procuring services" OR "monitoring and evaluation") AND TITLE-ABS-KEY ("Primary Care" OR "Primary healthcare" OR "Primary Health Care" OR "Primary Health-Care" OR "Primary Health" OR phc OR "general practi*")) AND (LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019)) AND (LIMIT-TO (LANGUAGE , "English"))
Web of Science	02/03/2022	145		(((TS=("Data" OR "Insights" OR "Statistics" OR "Business Analy*" OR "business intelligence")) AND TS=(NHS OR "National Health Service" OR "Public Health England" OR "Department of Health" OR "English healthcare" OR "English Health Care")) AND TS=("competitive tendering" OR fundholding OR fund-holding OR "strategic contracting" OR "strategic buying" OR procurement OR purchas* OR "contracting out" OR gpfh OR "Primary Care Groups" OR "PCG*" OR "Primary Care Trust*" OR "PCT*" OR "Clinical Commissioning Group*" OR "CCG*" OR "commissioning" OR commissioner* OR “Assessing needs" OR "reviewing service provisions" OR "deciding priorities" OR "designing services" OR "shaping structure of supply" OR "planning capacity and managing demand" OR "supporting patient choice" OR "managing performance" OR "seeking public and patient views" OR "Needs assessment" OR "planning" OR "Market management" OR "Market development" OR decommissioning OR disinvestment OR "performance management" OR "procuring services" OR "monitoring and evaluation")) AND TS=("Primary Care" OR "Primary healthcare" OR "Primary Health Care" OR "Primary Health-Care" OR "Primary Health" OR phc OR "general practi*")
CINAHL	15/03/2022	89		AB (Data OR Insights OR Statistics OR Business Analy* OR business intelligence) AND AB (NHS OR National Health Service OR Public Health England OR Department of Health OR English healthcare OR English Health Care) AND AB (competitive tendering OR fundholding OR fund-holding OR strategic contracting OR strategic buying OR procurement OR purchas* OR contracting out OR gpfh OR Primary Care Groups OR PCG* OR Primary Care Trust* OR PCT* OR Clinical Commissioning Group* OR CCG* OR commissioning OR commissioner* OR Assessing needs OR reviewing service provisions OR deciding priorities OR designing services OR "shaping structure of supply" OR

				"planning capacity and managing demand" OR supporting patient choice OR managing performance OR "seeking public and patient views" OR Needs assessment OR planning OR Market management OR Market development OR decommissioning OR disinvestment OR performance management OR procuring services OR "monitoring and evaluation") AND AB (Primary Care OR Primary healthcare OR Primary Health Care OR Primary Health-Care OR Primary Health OR phc OR general practi*)
Embase (see below)	02/03/2022	172		
ProQuest Dissertations & Theses Global (see below)	02/03/2022	8		

Embase

# ▲	Searches	Results
1	(Primary Care or Primary healthcare or Primary Health Care or Primary Health-Care or Primary Health or phc or general practi*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word]	400216
2	limit 1 to (english language and yr="2019 - 2022")	63891

3	(Data or Insights or Statistics or Business Analy* or business intelligence).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word]	6690125
4	limit 3 to (english language and yr="2019 - 2022")	1419972
5	(NHS or National Health Service or Public Health England or Department of Health or English healthcare or English Health Care).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word]	131721
6	limit 5 to (english language and yr="2019 - 2022")	19892
7	(competitive tendering or fundholding or fund-holding or strategic contracting or strategic buying or procurement or purchas* or contracting out or gpfh or Primary Care Groups or PCG* or Primary Care Trust* or PCT* or Clinical Commissioning Group* or CCG* or commissioning or commissioner* or Assessing needs or reviewing service provisions or deciding priorities or designing services or "shaping structure of supply" or "planning capacity and managing demand" or supporting patient choice or managing performance or "seeking public and patient views" or Needs assessment or planning or Market management or Market development or decommissioning or disinvestment or performance management or procuring services or "monitoring and evaluation").mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word, floating subheading word, candidate term word]	724492
8	limit 7 to (english language and yr="2019 - 2022")	124383
9	2 and 4 and 6 and 8	172

ProQuest

S12	ab("Data" OR "Insights" OR "Statistics" OR "Business Analy*" OR "business intelligence")Limits applied Databases: ProQuest Dissertations & Theses Global Limited by: Date: From 01 January 2019 to 31 December 2022 Language: English

S13	ab(NHS OR "National Health Service" OR "Public Health England" OR "Department of Health" OR "English healthcare" OR "English Health Care")Limits applied Databases: ProQuest Dissertations & Theses Global Limited by: Date: From 01 January 2019 to 31 December 2022 Language: English

S14	ab("competitive tendering" OR fundholding OR fund-holding OR "strategic contracting" OR "strategic buying" OR procurement OR purchas* OR "contracting out" OR gpfh OR "Primary Care Groups" OR "PCG*" OR "Primary Care Trust*" OR "PCT*" OR "Clinical Commissioning Group*" OR "CCG*" OR "commissioning" OR commissioner* OR "Assessing needs" OR "reviewing service provisions" OR "deciding priorities" OR "designing services" OR "shaping structure of supply" OR "planning capacity and

	managing demand" OR "supporting patient choice" OR "managing performance" OR "seeking public and patient views" OR "Needs assessment" OR "planning" OR "Market management" OR "Market development" OR decommissioning OR disinvestment OR "performance management" OR "procuring services" OR "monitoring and evaluation")Limits applied Databases: ProQuest Dissertations & Theses Global Limited by: Date: From 01 January 2019 to 31 December 2022 Language: English

S15	ab("Primary Care" OR "Primary healthcare" OR "Primary Health Care" OR "Primary Health-Care" OR "Primary Health" OR phc OR "general practi*")Limits applied Databases: ProQuest Dissertations & Theses Global Limited by: Date: From 01 January 2019 to 31 December 2022 Language: English

S16	s15 AND s14 AND s13 AND s12 Databases:

ProQuest Dissertations & Theses Global

Appendix 3.2: sample interview questions (commissioners)

1) Many commissioners use data to make their decisions about what to commission. Can you tell me a bit about the types of evidence, documents or information you used to inform your commissioning decisions?
2) In your experience, how do commissioners respond to variation data? In what circumstances are variation data useful (or not) in commissioning decisions?
    a. Based on the meetings I've looked at, some CCGs appear to use prescribing data in decision making? Could you tell me a bit more about how you might use this, if at all?
3) Do you have experience of working with external organisations (e.g. management consultancies or analytics providers) who provided support with analysing and/or providing data to inform commissioning decisions? When is this useful? Why?
    a. How do they compare to internal BI team? When might you use an external company vs. your internal team?
4) I've seen examples in the literature where "data champions" - individuals who are passionate about using data effectively and who promote data best-practice - have proven themselves essential to increasing the usage of data in commissioning decisions. Is this something you've come across and do you think it's effective?
5) Do you have any experience of gathering qualitative information (e.g. interviews or focus group outputs) to better understand data? How or when might qualitative information be helpful?
    a. Potential follow up: in some of the meeting recordings I've listened to, commissioners appear to gather qualitative information in instances where they struggle to understand and operationalise data – is this something you've come across as part of your work?
6) Do you think commissioners ever perceive commissioning data to contain flaws or be of low quality? How might they react in this scenario?
    a. Potential follow up: in some of the meeting recordings I've listened to, commissioners appear to be willing to use flawed or imperfect data provided they understand its limitations – is this something you've come across as part of your work?
7) To what extent is timely access to data a challenge to commissioners?
8) Some CCGs are increasingly attempting to combine different datasets and use them as part of their commissioning process. is this something you've come across, and why do you think this might be used?
9) In some of the studies I've read on commissioning, commissioners have felt that financial challenges or pressures can trump data or evidence – is this something you've come across?

10) In your experience, do commissioners ever have difficulty operationalising the data they have access to? Is this more common in certain contexts or certain types of data?
11) In some meeting recordings I've listened to, commissioners appear to discuss using data to 'nudge' or shame certain clinicians and service providers to provide better commissioning outcomes, e.g. by presenting a primary care scorecard or prescribing data to GPs. Is this a practice you've come across? Do you think it is useful, and if so what outcomes might it achieve?
    a. Follow up: I've also seen the opposite happen, e.g. commissioners approaching GPs and service providers with variation data in conjunction with an offer of support or sharing best practice – do you think this is more helpful? Why?
12) Based on the reading I've done it appears that commissioners are increasingly looking at data on inequalities when making commissioning decisions? To what extent does this play a role?
13) To what extent do you have experience of using combined datasets in commissioning, and how or why do you find them useful?
14) In your view, are there particular ways that data can be presented (or not) to commissioners that can increase engagement or understanding? Dashboards, programmes they can manipulate, etc.?
15) When you reflect on the types of data that you have access to as a commissioner, are there any particular characteristics both of the data itself and how it is presented that make it particularly useful (or not) to you? Can you provide examples?
16) Are there any particular challenges or scenarios relating to utilising data to inform primary care commissioning decisions that have not been covered in this conversion?

Appendix 3.3: sample interview questions (experts)

1) Do you have any observations of commissioners working with external organisations who provided them with data or data analysis? When do you think this worked well, and when did it not?
    a. One theory is that the relationship between the commissioners and the external organisation is key to promoting data use, and that a collaborative co-production approach will facilitate the usage of data
    b. Do you have any observations on the relationship between commissioners and CSUs in terms of CSUs providing data, and what worked well and what didn't?
    c. Do you think there are data related challenges or benefits that arise from using CSUs/external providers vs. internal BI teams?
2) I've seen examples in the literature where 'data champions' - individuals who are passionate about using data effectively and who promote data best-

practice - have proven themselves essential to increasing the usage of data in commissioning decisions. Is this something you've come across?

3) Some CCGs are increasingly attempting to combine different datasets and use them as part of their commissioning process. is this something you've come across, and why do you think this might be used?
    a. One theory is that commissioners find this useful because it gives them a better idea of the full patient journey
4) A commonly used piece of data in commissioning is variation data. Are there specific types of variation data that you think were commonly used in commissioning, and any that you think commissioners were more sceptical of?
    a. There is a theory that commissioners will be more sceptical of variation data if they believe there are factors outside of their control impacting the variation, e.g. poverty or the local demographics
    b. Whilst there is a theory of using variation data to "name and shame," many interviewees I've spoken to say they believe this is a bad approach to use because they don't want to "performance manage." Have you come across examples of "naming and shaming" in your observations?

        Opposite of this: try to be supportive as a follow on from variation data, e.g. providing support to specific practices, share good practice.

        There is an emerging theory that peer-review works related to variation data well in primary care commissioning, e.g. that GPs care about their performance against other GPs and are willing to listen to their peers

    a. There is a theory that variation data is sometimes used to 'start a conversation' e.g. by showing some prescribing data – is this a practice you've come across?
5) What are your observations on the usage of qualitative information in commissioning (these can be 'official' e.g. focus groups or interviews but also unofficial e.g. patient stories) and how this relates to data?
    a. Can you think of examples where it has been used to better understand data?
    b. Is it ever used alongside data to strengthen it?
6) In your observations, to what extent is low quality data a challenge for commissioners?
    a. There is a theory that commissioners may sometimes be willing to use data if they are aware of its limitations and flaws, but less likely to use it if they mistrust it in general?
    b. I've seen examples of clinicians, especially GPs, challenging data presented at commissioning meetings because it does not align with their 'lived experience' – is this something you can across?
7) To what extent is access to timely data a challenge for commissioners?

    a. A related complaint I've heard in some interviews is that "snapshots" of data aren't helpful, what are your observations?
8) In some of the studies I've read on commissioning, commissioners have felt that financial challenges or pressures can trump data or evidence – is this something you've come across?
9) Do you think there is ever a
10) Based on the reading I've done it appears that commissioners are increasingly looking at data on inequalities when making commissioning decisions? To what extent does this play a role?
11) In your view, are there particular ways that data can be presented (or not) to commissioners that can increase engagement or understanding? Dashboards, programmes they can manipulate, etc.?
12) To what extent is 'data overload' a challenge in commissioning?
13) To what extent might commissioners' technical skills and knowledge limit the usage of data?
    a. Did you every come across examples of commissioners having challenges operationalising the data they had access to (what does it all mean?)
14) Ability to design own data collection methods or KPIs (e.g. GPs designing own surveys, choosing own KPIs) more engagement vs. 'nationally given' data, is this true?
15) One issue that's come up is coding and inconsistent definitions – to what extent do you think this is a challenge for commissioners?
16) Both the literature and interviews have noted instances of "cherry picking" or "gaming data" to support things they wanted to do, is this something you've ever witnessed?
17) In the meetings recordings I've listened to, there have been very few, if any, examples of commissioners completely redesigning pathways and using data to guide this. In your paper, you describe commissioners using data to drive projects from the onset, e.g. the redesign or debates services and to improve the management of long-term conditions

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