Oral Healthcare in England: Workforce Perspectives and Public Priorities

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Abstract

The oral healthcare system in England comprises of the National Health Service (NHS), offering a variety of services accessible to everyone, and a private sector. However, persistent oral health inequalities and issues regarding accessibility of NHS dental appointments suggest a system performing sub-optimally. This thesis investigates the factors which influence dental professionals' decisions about where to work, and patients' views and priorities for NHS dentistry.

Chapters 4 and 5 present data from qualitative interviews held with dental professionals (n=17) and the general public (n=20), analysed using a framework approach. The evidence presented demonstrates a range of push and pull factors which influence where dental professionals provide labour, highlighting the ideological commitment to the NHS, but that the working conditions detract from patient-centred care. The findings from the public interviews demonstrate a variety of interpretations of oral health and clinically necessary treatment under the NHS. The private sector was discussed as supplementary, but raised equity concerns.

Chapters 6 introduces a preference elicitation exercise (a Benefit Trade-Off, or BTO) to establish if members of the general public (n=1,688) are willing to sacrifice efficiency (larger oral health gains) to reduce oral health inequalities. A series of methodological investigations follow in Chapter 7. The results from the BTO indicate that inequality aversion is low, meaning that maximising oral health is prioritised relative to reducing inequalities for most. The methodological results show that how the scenarios are presented can impact the result.

This thesis offers significant contributions to our understanding of NHS dentistry. The qualitative studies identify key factors which drive the workforce and presents public desires for oral health under the NHS. The BTO provides the first insight into inequality aversion in oral health globally. Future policies need to reflect the diversity of perspectives and be underpinned by sustainable approaches to improving oral health.

Dedication

In memory of Auntie Jean, who radiated joy and never failed to brighten my day.

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List of Abbreviations

ADHS	Adult Dental Health Survey
AGP	Aerosol-Generating Procedure
AOHS	Adult Oral Health Survey
BBC	British Broadcasting Corporation
BDA	British Dental Association
BTO	Benefit Trade-Off
CDS	Community Dental Service
CES HRSWF	Constant-Elasticity of Substitution Health-Related Social Welfare Function
CoT	Course of Treatment
COVID-19	Coronavirus SARS-CoV-2
DCEA	Distributional Cost-Effectiveness Analysis
GDP	General Dental Practitioner
GP	General Practitioner
HRA	Health Research Authority
HRSWF	Health-Related Social Welfare Function
IMD	Index of Multiple Deprivation
IPC	Infection and Prevention Control
MRS	Marginal Rate of Substitution
MRSS	Marginal Rate of Social Substitution
NHS	National Health Service
NHS BSA	National Health Service Business Service Authority
NHS CB	National Health Service Commissioning Board
NICE	National Institute of Health and Care Excellence
NIHR	National Institute for Health Research
OFT	Office of Fair Trading
OHIP-14	Oral Health Impacts Profile-14
OHRQoL	Oral Health Related Quality of Life
PCT	Primary Care Trust
PDS	Personal Dental Services
PHE	Public Health England
PIS	Participant Information Sheet
PPI	Patient and Public Involvement

PPIE	Patient and Public Involvement and Engagement
PPE	Personal Protective Equipment
PTO	Person Trade-Off
QALY	Quality-Adjusted Life Year
SOP	Standard Operating Procedure
SWF	Social Welfare Function
UDA	Unit of Dental Activity
VOICE	Valuing Our Intellectual Capital and Experience
WHO	World Health Organisation
WTA	Willingness to Accept
WTP	Willingness to Pay

Chapter 1: Introduction

1.1 Introduction

The resources underpinning any national health service are limited – funding is finite, often raised through tax, and the availability of the workforce can impact the accessibility of services, meaning decisions must be made about the objectives of a healthcare system (Mitton and Donaldson, 2004). In the context of the National Health Service (NHS) in England, the broad objectives of the healthcare system are to improve population health, and reduce inequalities (Williams, 2005). In the absence of any explicit objectives for the oral healthcare system, these principals should also be applied to NHS dentistry. However, there are persistent oral health inequalities and numerous reports of worsening access to NHS dental services due to dental professionals increasingly providing their labour in the private sector, which in turn is affecting those from the lowest socioeconomic backgrounds disproportionately (Healthwatch, 2023; Public Health England, 2021; Williams, Fisher and Edwards, 2023). The oral healthcare system is therefore not meeting either objective, and the provision of services is being determined by workforce choice instead of the social contract between the NHS and the population it serves (Tickle, 2012).

In a climate where the consensus is that NHS dentistry is failing both those who work within it and those who use it there needs to be careful consideration of two core issues:

1) The priorities of the NHS dental service
2) The factors which influence where the dental profession choose to work

Addressing these two issues will provide valuable insight into what should be addressed in terms of what the priorities of system reform for NHS dentistry should be, and how the workforce can be rebuilt to provide a sustainable workforce to reach these objectives. The following thesis uses a combination of qualitative and quantitative methods to address these issues.

1.2 Thesis structure

The following thesis is structured as following. There are 8 Chapters, including this introductory chapter. The following chapter, Chapter 2, will provide an oversight of NHS dentistry, including the core economic concepts, the history of the contractual arrangement between the NHS and dental professionals in England, and an

assessment of the oral healthcare market today. Chapter 3 introduces the methods common to both of the qualitative studies, which can be found in Chapters 4 and 5.

Chapter 4 presents the qualitative framework from the provider perspective, specifically how the profession make labour decisions and providing insight into the issues which are contributing to a shortage of the workforce in NHS dentistry. Chapter 5 addresses NHS dentistry from the public perspective, qualitatively exploring the priorities members of the general population would like to see reflected in an NHS oral healthcare system, and considering who they believe should be represented when decisions have to be made about NHS dentistry.

Chapter 6 builds on the qualitative studies, using a quantitative preference elicitation exercise to assess the relative importance of two priorities identified in Chapter 5: oral health and inequality reduction. The next chapter, Chapter 7, uses data collected to assess some potential quantitative methodological issues associated with the preference elicitation exercise. Chapter 8 provides discussion of the thesis as a whole.

Chapter 2: Understanding dentistry in England: economic concepts, history and the National Health Service dental contract

2.1 Introduction

This chapter provides important context for the thesis, starting with economic concepts which underpin the oral healthcare system in England. This is followed by a brief history of modern dentistry in England (i.e. since the inception of NHS dentistry - 1948 onward) and the present-day contractual arrangements. The focus – for this chapter and the entirety of the thesis – is on England. Devolution across the United Kingdom has resulted in a gradual divergence of NHS services in England, Wales, Scotland and Northern Ireland and therefore the resulting NHS oral health services are different across these countries (Chestnutt, 2014; Padilla, 2014).

2.2 Economics and dentistry

This section explores some key economic issues in relation to dentistry. These are:

- Imperfect markets
- The principal-agent problem
- Equity

2.2.1 An imperfect market

Perfectly competitive markets underpin the idea of the free market, where price and quantity of goods is determined by supply and demand. The conditions for a perfectly competitive market are as follows:

- Products are identical
- Numerous buyers and sellers
- Perfect information between buyers and sellers
- No barriers to entry

Under perfect market conditions the market operates efficiently: there is no shortage, as new suppliers can enter the market, there is no surplus, as price can drop to meet demand and everyone operates under full information. The full information condition refers to all actors – meaning both those who supply, and those who consume goods – knowing what goods/services cost, the price, and the utility which will be derived from consumption.

It is widely acknowledged that the healthcare market does not meet these conditions. Arrow (1978), for example explores several aspects in which healthcare – and therefore oral healthcare – markets do not reflect perfectly competitive markets. These include: medical care as a non-marketable commodity, pricing and barriers to

entry in terms of education and licensing (Arrow, 1978). The following sections will explore demand, supply and market failure in relation to dentistry in England.

Demand

The very nature of demand in relation to healthcare services is defined by its unpredictability, as healthcare is not usually required unless an individual has ill health – with the exception of preventative services (Arrow, 1978). Whilst the same can be said for oral healthcare, it is also true that unlike a significant amount of medical conditions the majority of dental disease is preventable (Peres *et al.*, 2019). An efficiently operating market for oral health would have regular care (check-ups based on risk factors), preventative services and treatment based on emergent oral healthcare needs. Instead, dental disease is widespread and dental services are critiqued for being treatment orientated, overlooking the preventative aspects of care and the root causes of dental disease (Watt *et al.*, 2019). Furthermore, those from the lowest socioeconomic backgrounds usually experience the worst oral health and those who have the greatest need for oral healthcare are often not those who receive the service (Birch *et al.*, 2021). This is an example of the inverse care law, as identified by J. T. Hart in 1971: “The availability of good medical care tends to vary inversely with the need for it in the population served” (Hart, 1971). There is some speculation that the inverse care law is a result of people from higher-income backgrounds being in a better position to access and utilise care (Titmuss and Seldon, 1968). However, this is difficult to prove. Particularly in relation to dentistry, as the available statistics often refer to the amount of care which has been delivered – and is therefore a measure of utilisation, not demand or need (Hart, 1971).

Need itself is not an agreed upon concept. Bradshaw (1972) suggests four different types of need: firstly, normative need in which need is assessed relative to a standard set by an expert. Secondly, felt need which is equivalent to a want. Thirdly, expressed need which is thought of as demand and finally comparative need, which is people with similar characteristics with only some receiving a service, i.e. a person or a group is left ‘wanting’. Culyer and Wagstaff (1993) suggest four different definitions of need which account for equity and equality considerations: need as initial health, need as capacity to benefit, need as expenditures a person ought to have, and need as expenditure required to exhaust capacity to benefit. The first, need as initial health accounts for the starting point of health, which reflects the health status of the individual and is therefore a reflection of need as current health.

The second, need as capacity to benefit suggests a consequentialist framework in which need is considered relative to a health, or healthcare, goal and accounts for not only the current health status of the individual but their prospective health. The third, need as expenditures a person ought to have introduces a normative consideration and reflects the idea that social values are an important consideration in relation to need, and entitlement is dependent on what we, as a society, believes someone is entitled to. The final definition, need as expenditures required to exhaust capacity to benefit proposes that it is the relationship between health and healthcare which is critical, and frames need in terms of what can done to treat the individual to improve their health and the associated healthcare expense as an acknowledgement that different health conditions have different treatments available, which differ in both cost and effectiveness.

As can be seen by the above (and diagrammatically in Culyer and Wagstaff (1993)) how one chooses to define need can vastly impact service evaluation, and therefore the extent to which need is unmet. The NHS provide the following statement regarding the availability of dental services:

> *"The NHS will provide any clinically necessary treatment needed to keep your mouth, teeth and gums healthy and free of pain."*
> *(NHS, 2023)*

It is implied in this statement that need is normative and therefore related to the third proposition from Culyer & Wagstaff (1993) – need as expenditures a person ought to have. However, it should also be noted that although the definition outlines a *'mouth, teeth and gums healthy and free of pain'* there is no clinical guidance for this, and treatments are provided under the discretion of the practitioner, i.e. an individual assessment of the services a person ought to have.

There is also the concept of unmet need. Unmet need refers to the difference between those who access a healthcare service when it is required, and those who do not despite having equal requirement and equal coverage, i.e. the difference between demand and utilisation (Bygren, 1974). There are many reasons why one may not access healthcare when required: there may not be sufficient services which are accessible in the locality, the care may not be affordable, or offered care may be unacceptable to the service user (Tanahashi, 1978). In relation to dentistry in England, the 2009 Adult Dental Health Survey (ADHS) identified that availability,

cost, dental anxiety and the patient-dentist relationship created barriers to accessing NHS dental care (Freeman *et al.*, 2011).

Another issue to acknowledge in relation to demand is moral hazard. In general, moral hazard refers to a scenario where insurance (whether that be private coverage, or public services, both of which may involve cost-sharing) changes how someone acts, for example if a party knows they are not going to be fully liable for the repercussions of their actions and therefore engage in 'risky' behaviours (Zweifel and Manning, 2000). Whilst there are issues of moral hazard for both potential users and suppliers of dental care, the section regarding the principal-agent problem will explore the supply side application. For the demand-side, moral hazard outlines a scenario where the existence of insurance (or, in the case of NHS dentistry, universal healthcare with potential cost-sharing) can create adverse incentives. If healthcare is free or significantly subsidised, potential patients may engage with preventative oral healthcare less than they would under a system where they are fully liable for their oral healthcare costs, or may over-use services because the restorative treatments are without financial cost (Nguyen and Worthington, 2023).

Supply

The oral healthcare market is imperfectly competitive: whilst the NHS may be dominant in health and oral health, and it may behave monopolistically, it does not hold a monopoly (Grembowski *et al.*, 1988). It is also not a duopoly or an oligopoly, as there is a wide array of suppliers in the private sector. This number however has a theoretical limit as professional protectionism also means there's a limited number of licenses, i.e. to provide dental care one must receive a qualification, and there is a limited number of places to study per year (Tuominen, 2018). Although dental graduates from other countries are able to work in England, to provide NHS dental care dentists are required to get a performer number by working as a foundation year dentist in the NHS as part of their professional training. They are not required to get a performer number in order to provide private dental care. Whilst this can be considered one significant barrier to entry to the NHS dental care sector, the Office of Fair Trading (OFT) also identifies the NHS dental contract as a barrier to entry as only a limited amount of dental contracts are put out to competitive tender each year (Office of Fair Trading, 2012).

Whilst it is hard to attain a figure which accurately reflects how much dental care is available, and in which marketplace (public/NHS, or private), there are a few metrics

which can provide some insight[1]. For 2024, the General Dental Council reports that 44,209 dentists are currently registered in the UK, and in 2022-2023 24,151 dentists provided some NHS treatment in England (General Dental Council, 2024; NHS Dental Statistics, 2023). There are approximately 42.9 dentists per 100,000 people in England, which is lower than numbers reported for other European countries (National Audit Office, 2020).

Whilst these statistics provide an overview of how many dentists are available in England, what this data does not provide an insight into is how dentists use their time, e.g. how much they work overall, and the labour they supply to NHS and/or private dental services. There is some indication of this available from the NHS Business Service Authority (NHS BSA) report on 'Dentists' Working Patterns, Motivation and Morale' from the 2019-2020 financial year. This data indicates that NHS practitioners from 2018-2019 to 2019-2020 dropped the number of hours they are working in NHS dentistry, from 74.1% to 73% of their time spent in NHS General Dental Practice (GDP) (NHS Digital, 2020). 55% of associates in GDP agreed with the statement 'I often think about leaving general dentistry', whilst this number was 61.3% for principals (NHS Digital, 2020). This data reflects that although most of a dentists time was spent providing NHS dental care in the 2019-2020 financial year, the number of hours spent in NHS dentistry was dropping and a significant proportion of the workforce was considering leaving the workforce entirely. Another note: although the most up-to-date at time of writing, this data was collected prior to the global coronavirus SARS-CoV-2 (COVID-19) pandemic and may not be an accurate reflection of how practitioners spend their time in 2024.

2.2.2 The principal-agent problem

Arrow notes that there is always an inequality between the information of those who supply and those who consume a good or service, but this is exacerbated in a healthcare setting where it can be difficult for patients to accurately estimate the gain (or, utility) they will derive from a healthcare service (Arrow, 1978). This inequality of information between healthcare provider and patient is later termed as the principal-agent problem, where one party (the principal) has to entrust that another (the agent) will act in their best interests, given they are unable to act for themselves. When the agent makes the same choices as the principal would have given the same

[1] At the time of writing and reviewing (March 2024) each of these figures is the most up to date available.

information and expertise, they are known as a ‘perfect’ agent (Evans and Brown, 1984). However, the asymmetry of information can lead to agents acting imperfectly – knowingly or unknowingly. Agents may act paternalistically, believing they know what is best for the patient and therefore inadvertently acting against the patient’s wishes. Alternatively, they can use the imbalance of information to recommend or provide unnecessary services/treatments to maximise their income, where the latter is a form of supplier induced demand (Woods, 2013). In the context of NHS dentistry, the information available for patients has been identified as insufficient. The OFT identified that dental practices did not provide sufficient information about NHS and private charges, and patients often received treatments without a written treatment plan (Office of Fair Trading, 2012). Other research from the North East of England echoed this, with patients reporting being upsold treatment they were unaware would incur additional fees (Holmes *et al.*, 2015). Both of these reports highlight the imbalance of information, but also suggests that little is done to correct the asymmetry of information and therefore patients are unable to make informed choices and are vulnerable to supplier induced demand. This is supported by the literature which examines the impact of different payment systems in dentistry, with fee-per-item systems producing higher clinical outputs – with evidence to indicate that some of this activity is the result of supplier induced demand (Birch, 1988; Brocklehurst *et al.*, 2013).

2.2.3 Equity

Section 2.1.1. outlines how the oral healthcare market is imperfect and cites some examples of how supply and demand cannot operate along the principles of a free market. Another way in which oral healthcare is unique is through the significant government intervention – i.e. the existence of NHS dentistry. Subsequent sections will document the establishment of NHS dental care and its transformation since its introduction, but it is worth noting here that the public oral healthcare system exists because the free-market allocation is thought to fail completely without significant government intervention (Donaldson *et al.*, 1993). For example, healthcare markets which are dominated by insurance policies result in adverse selection, meaning individuals ‘sort’ themselves into groups depending on their expected use – and cost – of healthcare, with people who consider themselves high-risk and high expense choosing high coverage, more expensive premiums, whilst those who consider themselves low risk, and low expenditure, picking more moderate plans (Cutler and

Zeckhauser, 1998). Cutler and Zeckhauser (1998) identify three inefficiencies as a result of adverse selection: firstly, prices charged do not reflect provision cost, meaning individuals pick sub-optimal coverage plans, secondly there is minimal risk-spreading between high and low risk groups, and finally insurance plans change their offers to attract healthy individuals – and deter those who are sick. These are arguably a product of information asymmetry, which allows the insurer to charge a marginal cost above the market rate, but also because those who are receiving the insurance have better knowledge of their health and likely use of healthcare services. Ultimately, adverse selection in a healthcare insurance market can develop into what has been termed a 'death spiral', where premiums increase and memberships decline as healthy individuals are priced out. Those who continue to subscribe to the high-premium are therefore those who will derive value from it: those who are sick, and high cost.

Whilst NHS dentistry cannot be considered to be a public good in the traditional sense – it does not meet the conditions of being non-exclusionary and non-rivalry – it may be considered a quasi public good as it addresses oral healthcare needs which are neglected by private oral healthcare, and therefore helps to maximise societal welfare (Karsten, 1995). Continuing the previous example of adverse selection, NHS dentistry arguably provides risk-pooling of individuals, meaning individuals no longer self-select into insurance plans, and phenomena such as the adverse selection death spiral does not occur. Other market failures have also been documented – such as supplier induced demand – however the impact of externalities and social welfare has yet to be explored. Whilst externalities are often thought of as things which are out of the control of the individual but can, and do, impact them, in the context of healthcare externalities are also related to the principals by which we, as a society, want to live by and our philanthropic interests for the worst-off groups (Culyer, 1971). A significant consideration of the oral healthcare system is therefore equity.

Equity considerations for oral healthcare can be explored through a distributive justice framework. Based on the ideals of social justice, which is described as a 'moral directive to a *just* allocation of resources, a *fair* compensation to providers, and a *reasonable* range of services' by Dharamsi and MacEntee (2002) the complexities of distributional justice are readily apparent due to the different subjective interpretations of just, reasonable, and fair. For example, in their 2021 report on inequalities in oral health Public Health England (PHE) stated that good

oral health is imperative to wellbeing, and the inequalities associated with oral healthcare are unjust, yet this is contentious as their stance includes psychological impacts which are not included in the NHS definition of ‘clinically necessary’ (NHS, 2023; Public Health England, 2021). The normative assessment of need used by NHS dentistry therefore may not lead to outcomes considered equitable by PHE, even if NHS dentistry is able to deliver the care outlined in the dental offer to everyone who wishes to use it.

Two ways in which equity can be operationalised at a policy level are through the concepts of vertical and horizontal equity, where vertical equity refers to unequal needs requiring unequal treatment (i.e. treatment proportional to need) or horizontal equity, where those with equal need get the same treatment regardless of other characteristics (e.g. socioeconomic status, age, gender) (Wagstaff, Van Doorslaer and Paci, 1991). Arguably, both these principals can be seen in the NHS dental offer – with GDP appointments available to all regardless of their characteristics, and urgent dental care offering increased access for those with immediate needs. However, given the current issues with the oral healthcare system it may be argued that these principals are not operationalised, and recent reporting would suggest that neither version of equity is achieved as there is discrimination against those with lower socioeconomic backgrounds, who often have higher dental needs (Healthwatch, 2023; Watt, 2007).

Furthermore, as noted previously there can be a difference between the availability and the utilisation of a service (Harris, 2013). An oral healthcare system which affords everyone access, and ease of access is equal, has achieved an equality of opportunity, as outlined by Rawls (Rawls, 1971). However, despite equality of opportunity utilisation may be different and therefore result in oral health inequalities. These can still be considered equitable given everyone had the same opportunity to use services. As it stands, the oral healthcare system does not afford an equality of opportunity (Healthwatch, 2023). Even though exemptions to payment exist to mitigate the affordability of NHS dental care, financial barriers still exist for those on low incomes, and there are non-financial barriers which impact utilisation, such as travel to and from dental practices, and the opportunity cost of time (Van Doorslaer and Wagstaff, 1992).

2.3 Oral health in England: an overview

This section will focus on the recent trends in oral health in England, particularly focusing on the presence and progression of disease from 1968 as this is when the Adult Dental Health Survey (ADHS) was established – now the Adult Oral Health Survey (AOHS). The decennial AOHS is a national data collection scheme whereby randomly sampled adults are invited to complete a survey on their oral health, complemented by a clinical examination carried out by an oral health professional (dependent on consent) however over its establishment there have been changes in the questions, the methodologies, and the participating countries (Steele *et al.*, 2012). The data collected in these surveys is typically a combination of Oral Health Rated Quality of Life (OHRQoL) and clinical measures, although the exact measures have changed over time. These surveys offer comparable insights into oral health and disease progression over the last sixty years – although the most recent iteration (with data collected from 2021) has yet to have a full report published.

When the NHS and NHS dentistry was established in 1948 the burden of oral disease within the population was vast, with wide-spread decay, sepsis and many individuals were edentate (Steele, 2009). The initial ADHS in 1968 found that 37% of the population above the age of 16 were edentulous, meaning they had no natural teeth (Gray *et al.*, 1970). Of those who were dentate – meaning they have one or more natural teeth – the mean number of teeth was 21.9 (Steele *et al.*, 2012). By 2009, the figure of people who were edentate had dropped to 6%, and in 2021 this was 5% whilst the mean number of teeth in dentate adults was 25.7 and 25.4 respectively (Office for Health Improvement & Disparities, 2024; Steele *et al.*, 2012). Whilst these figures show a significant improvement since the ADHS started in 1968, given the data which is currently available for 2021 it is not possible to conclude why the average number of teeth in dentate adults has dropped between 2009 and 2021 – e.g. if it is a function of an aging population, or if there is increased tooth-loss happening earlier in the life-course. Those retaining their functioning dentition (in this case defined as 21 or more natural teeth) has increased for all ages groups between each period of data collection (1978, 1988, 1998 and 2009), with those later in the life course less likely to retain functioning dentition (Steele *et al.*, 2012).

The prevalence of caries was 31% in 2009, which was lower than the rate reported for 1998, but the rate of severe dental disease (as measured through pocketing over 6mm) increased by 3%, affecting 9% of adults (White *et al.*, 2012). For those with

caries, the number of affected teeth remained constant at 2.7. The prevalence of caries in 2009 had an inverse relationship to age, with younger age groups presenting more frequently with caries (White *et al.*, 2012). This data is not yet available for the 2021 AOHS.

For oral health impacts in 1998, 2009 and 2021 which is used to represent the oral health-related quality of life the prevalence is fluctuating, with 51%, 41% and 47% reporting occasional issues with their oral health respectively (Office for Health Improvement & Disparities, 2024; Steele *et al.*, 2012). Feeling self-conscious, having discomfort when eating, and aching in the mouth being the most frequently reported impacts in 2021 (28%, 24% and 20%), whilst in 2009 the most commonly reported oral conditions were difficulty eating, avoiding smiling and cleaning teeth (Office for Health Improvement & Disparities, 2024; Steele *et al.*, 2012).

2.4 A brief history of the dental contract

Using the economic concepts outlined in section 2.2 as a backdrop to the establishment of the NHS dental service it is now important to consider the history and legacy of NHS dentistry. It is vital to explore past oral health of the nation and the previous contract iterations as these have been formative in the expectations for both patients and practitioners and shaped the landscape of dentistry, and oral health of the population, today.

Dentistry has been part of the services offered by the NHS since its inception in 1948 (Tickle, 2012). In the decades since the needs of the population in terms of oral health have evolved dramatically, and how dental professionals are contracted to provide dental care to the population has gone through several iterations.

2.4.1 1948-1990: Fee for service

Prior to 1948, dentists worked on a private basis. The profession agreed to work with the NHS as independent contractors known as General Dental Practitioners (GDPs) on a fee-per-item basis as part of a national contract, meaning dentists were paid according to the volume of work they delivered (Tickle, 2012). There were no limits to the volume of treatments a GDP could deliver, and the amount spent on NHS dentistry at the national level was uncapped. The expenditure on NHS dentistry was quickly identified as unsustainable and to help alleviate the financial burden on the government, patient charges were introduced in 1951 (Shah and Wordley, 2021; Steele, 2009). Whilst initially the charges were limited to £1 for dentures, the

following year patients were asked to pay for treatments with each individual procedure associated with a unique charge.

Whilst initially a significant amount of dentistry was focused on extractions and function for the edentulous population (resulting in a lot of dentures), over time the needs of the population had changed and there was more focus on restoring existing teeth. The fee-for-item payment system for dentists remained unchanged and ultimately fuelled a cycle of ‘drill and fill’, where dentists focused on treating problems with natural teeth as opposed to preventing issues from occurring and arguably lead to over-treatment. This was identified by as an issue by policy makers, and consequently changes to the dental contract were made in 1990.

2.4.2 1990-2006: Registration and Capitation

The 1990 contract introduced registration of patients and capitation for children registered to practices, which accounted for approximately 20% of the spend on dentistry (Steele, 2009). In this context, the capitation scheme paid each practice a set amount per child that was registered at that practice. There was not a payment associated with adults, but adults were registered with practices. Registration and capitation were introduced to encourage dentists to move away from ‘episodic’ care and toward continuity of care thought to benefit patients in the long-term (Tickle, 2012; Wilson and Gelbier, 2016). Alongside the capitation model, GDPs were still paid for the treatments delivered using the fee-per-item structure, and the combination of payment systems resulted in an overspend in the budget allocated to NHS dentistry (Tickle, 2012). This was determined to be unsustainable, and as a result the fees paid to dentists were reduced in 1992 by approximately 7% through a scheme by the Department of Health (Steele, 2009; Tickle, 2012).

The reduction of fees in 1992 is now cited to be the start of animosity between the dental profession and the Department of Health (Tickle, 2012). As a response to the initiative many dentists decided to shift their supply to the private sector – either providing only private dental care or reducing the amount of NHS care available to increase the supply of private care. The decision to shift their labour away from NHS dental services caused issues with the supply of dental care, and patients began to struggle to access NHS dental care (Steele, 2009; Tickle, 2012). In response the Government initiated a pilot scheme, named Personal Dental Services (PDS) in 20 practices across England but wider system reform was not initiated until 2006. The

PDS pilots were intended to deploy locally negotiated contracts to address area specific needs and focus the service on quality dental care (Goodwin *et al.*, 2003).

2.4.3 2006 System Reform

The 2006 contract initiated a whole system reform for NHS dental care in England with intentions of reducing oral health inequalities and improving access to NHS dental care (Renson, 2002). This reformed system is the basis of commissioning, delivering and receiving NHS dental care in England today (April 2024), however it is not the piloted PDS initiative. In the 2006 system, Primary Care Trusts (PCTs) – which were local-level NHS organisations/budget holders – were tasked with commissioning Units of Dental Activity (UDAs) from dental practices in their areas, where the UDA is a representation of the different treatments available from NHS practices (and will be explained in more depth shortly). This essentially meant that each PCTs had to decide how much dental care to contract (or 'purchase') from their local practices, balancing this with alternative services offered by community dental services or public health services.

The 2006 contract introduced an alternative payment system. This was designed to reduce oral health inequalities and improve the working environment for dentists (House of Commons, 2005 ; Renson, 2002). The new commissioning system meant PCTs were now responsible for purchasing an amount of complete course of treatments (CoT) as measured by UDAs from a dental practice, where dentists still operated as independent contractors. Treatments were banded together into three categories according to complexity, and the renumeration available was based on these three categories. The banding of UDA's and a selection of corresponding treatments are in the Table 2.1. The patient charges reflect those which were levied when the contract was introduced, in 2006 (House of Commons Health Committee, 2006):

Band	Treatments	UDAs	Patient charges (2006 rates)
1	- Exam - Sealants and fluoride varnish - Scale and polish	1	£15.50
2	- Fillings - Root planing,	3	£42.40

	- Deep scale and polish - Extractions		
3	- Bridges - Crowns	12	£189.00

Table 2.1: Treatment bands, UDAs and patient charges from the 2006 contract

The contracts between NHS England and dental practices would now specify the volume of UDAs the practice is required to deliver and the monetary amount practices would be reimbursed per UDA delivered. Dentists are only reimbursed for the highest banded procedure undertaken in a single CoT, where a CoT can cover multiple items from bands 1-3 over a six month period. The introduction of UDAs would guarantee practices, and those working within them, an income as long as they delivered the agreed amount of UDAs but would be subjected to clawback if they underdelivered (Freeman, 2008). Through clawback, if a practice delivers under 96% of their UDAs as outlined in their contract with NHS England, the regional commissioners who provided the contract are able to claim the undelivered value back from the dental practice. The UDA system meant practitioners were no longer rewarded for each item of treatment provided, therefore removing the incentive to over-treat patients. Instead, it was hoped the UDA system would increase the focus on preventing the development and progression of dental disease. When the UDA renumeration system was introduced in 2006, it was untested (Holmes *et al.*, 2015).

The 2006 contract removed the requirement to register patients and there was no longer capitation available for children. Whilst practices still have patient lists, the dynamic is different – the practice has no obligation to see a patient unless they are currently engaged within a course of treatment. Informally, practices tend to operate on the basis of if a patient is not a regular attender (typically if they have not seen the dentist in two years) they are removed from the patient list, and they may not see the same oral health professional. This change removed the element of continual care, introduced by the 1990 contract.

Commissioners are not able to specify how the UDAs for each dental practice should be distributed between the bands of treatment. As the contract is negotiated by each individual practice and a commissioner for that area, there is variation in the value associated with a UDA for each practice. The baseline for these amounts was determined by the practice activity when the contract was introduced, immediately prior to 2006. To give an example of the range of UDA values in 2023, the Local

Dental Committee in Hertfordshire reported a range of UDA rates in their county of £19.25 to £49.30, whilst BUPA reported a range £12.43 per UDA in Buckingham, Oxfordshire & Berkshire to £39.80 in Greater Manchester (Bupa Global & UK, 2023; Hertfordshire Local Dental Committee, 2023).

Technically, contracts can be renegotiated. When PCTs were dismantled in 2013, the NHS Commissioning Board (NHS CB) dental commissioning teams inherited the contractual arrangements from PCTs (NHS Commissioning Board, 2023). Contracts between GDPs and NHS England are held in perpetuity meaning the volume of UDAs commissioned from each practice and the amount paid per UDA is the same year on year. Contracts can be re-negotiated but typically as a result of under-performance (i.e. not to improve the UDA rate) and is known as 'rebasing' (NHS Commissioning Board, 2023).

The 2006 system reform also introduced a budget for dental services provided by the NHS. Previous spending on NHS dentistry had not been capped and resulted in overspends, with 'clawbacks' when spending was deemed to be too high. The total amount spent on NHS dentistry, and therefore the amount which could be reimbursed to practices, became fixed (Tickle, 2012).

Initial reception from the dental profession

The 2006 system reform caused discontent with the dental profession. An exploratory qualitative study of dentists operating in the North West of England identified the reforms did change how they operated, but ultimately these actions would be detrimental to the patients (Mcdonald *et al.*, 2012). Those interviewed felt like the contracts, and threat of clawbacks, meant they were orientated toward meeting targets and ultimately this did not align with the policy agenda of delivering high-quality, patient orientated care with an emphasis on prevention (Mcdonald *et al.*, 2012). This sentiment was echoed in Wales, which had implemented the 2006 contract with some minor variations (Chestnutt, 2014). A survey issued to a sample of dentists 18 months post-reform in Wales identified that only 11% liked the new system of renumeration, whilst 86% felt like they were still delivering patient care in a 'treadmill' environment. Similar amounts (83% and 85% respectively) felt like the system did not allow them to spend time issuing preventative advice, and that they were not able to spend more time with their patients (Chestnutt, Davies and Thomas, 2009).

The UDA system introduced a lot of disparity between dental practices, with new patients becoming an issue. As the dental practice is only reimbursed for the highest UDA value in a CoT, new patients became a 'risk' as the state of their oral health is unknown and therefore could be expensive to the practice if the treatment they need is extensive (Holmes *et al.*, 2015; Mcdonald *et al.*, 2012). Furthermore, dental practitioners reported a worsening relationship with the Department of Health/NHS as they believed the contract removed practitioner autonomy (Mcdonald *et al.*, 2012). Overall, the opinion of the dentists offering NHS dental care was that the reform did not meet the objectives of the Department of Health, and furthermore the incentives in place encouraged oral health interventions, not preventative care, in order to sustain their businesses, dental practices decided to reduce, or stop, providing NHS dental care after the introduction of the contract citing that the new system made it difficult to provide the best care for their patient and their businesses were no longer viable under the new system.

Commissioners identified that the focus of the contract was on the volume of care, with particular focus on increasing population access, not on the oral health of the patient or the quality of the service (Holmes *et al.*, 2015). They also stated their ability to manage local services felt constrained and were often forced to perpetuate resource allocations from the introduction of the 2006 contract instead of being able to actively commission new dental services (Holmes *et al.*, 2015). Where there was money unallocated in their budgets, this was the result of a practice under-performing on their contract or a contract being rebased. The availability of this resource is unreliable and ultimately for decision-making purposes this meant the finances had to be used as a one-off windfall, only available for the immediate future (Vernazza *et al.*, 2019).

2.4.4 2010 to 2022: Prototypes

The poor reception of the 2006 contract was recognised by the government after the 2008 Health Select Committee published a report outlining the shortfalls of the 2006 contract (House of Commons Health Committee, 2008). As a consequence, an independent review of NHS dentistry was commissioned and released in 2009, by Prof. Jimmy Steele – also known as the Steele Report, which has been referenced throughout this text. The Steele Report identified the need for a fundamental realignment to create a system which offered high-quality, accessible care for all (Steele, 2009). As a response to both the report and growing dissatisfaction among

the profession, a prototype new contract was launched in 2010. This included new care pathways, blended payment structures and emphasised the role of prevention in oral health. The prototype was trialled from 2010-2021 in a small number of practices and evaluated in 2016-2017 across five parameters: access, quality, oral health, sustainability and value for money (Rooney, 2018). The evaluation presented a mixed assessment of the reform. Whilst access, the issuing of preventative advice and oral health all increased practitioners raised issues about the sustainability of the new contract as the new care pathways – including issuing preventative advice – was time intensive. A later report released in 2023 reflecting on the performance of the prototypes from 2016-2019 again found mixed results relating to the prototype practices. The time spent with each patient increased, but this also meant the number of patients seen decreased, the CoTs undertaken decreased which also meant there was less revenue from patient charges (Department of Health and Social Care, 2023). Other findings included that access had decreased relative to non-protype practices, CoTs took longer, but practitioners were more closely following National Institute of Health and Care Excellence (NICE) guidance regarding treatment pathways (Department of Health and Social Care, 2023).

It was announced in 2021 that the prototype scheme was being discontinued, and prototype practices concluded their contracts in 2022 (NHS England, 2021). In their place, as an acknowledgement of the change being demanded, what would become known as ‘tweaks’ to the contract were announced in July 2022 (NHS England, 2022). Although at this juncture it should be acknowledged that the global coronavirus pandemic (COVID-19) impacted dental care during this period, this is not explicitly discussed until section 2.6.1.

2.4.5 2022: tweaking the contract

A letter to dental practices issued on the 19th of July 2022 outlined 6 goals for dental contract reform, which were formulated after a series of focus groups with ‘stakeholders and the profession’, including input from the British Dental Association (BDA)[2] (NHS England, 2022). The public were not consulted at this stage. The goals identified were:

1) For reforms to be developed with the profession
2) Improve oral health outcomes for patients

[2] The BDA is a trade union representing dentists and dental students across the UK

3) Prioritise prevention through compatible incentives, reduce incentives for care of low clinical value, and improve focus on evidence-based care
4) Improve access to NHS dental services with particular focus on inequalities across socioeconomic status and ethnicity
5) Ensure the NHS dental offer is inclusive so patients do not have to pay for private care
6) Be within the NHS budget

To achieve these goals, a minimum UDA reimbursement value to practices of £23 was introduced, practices would receive 5 UDAs when 3 or more extractions and fillings happen in a single CoT, and a course including any molar endodontics would receive 7 UDAs. These changes in the context of the other treatments available through NHS dental providers as outlined in Table 2.1 are in Table 2.2 below, with patient charges corresponding to the 2021/22 financial year (NHS BSA, 2023b)[3]:

Band	Treatments	Corresponding UDAs	Patient charges (2021/22)
1	- Exam - Sealants and fluoride varnish - Scale and polish	1	£23.80
2	- 1-2 Fillings - Root planing, - Deep scale and polish - 1-2 Extractions	3	£65.20
	3+ extractions and/or fillings	5	
	Molar endodontics	7	
3	- Bridges - Crowns	12	£282.80

Table 2.2: Treatment bands, UDAs and patient charges after the 2022 tweaks

Other changes relate to the 'best practice' for delivering dentistry in England, for example ensuring that practitioners and patients are aware of recall intervals being

[3] Since the 2021/22 financial year, NHS dental charges have increased twice: by 8.5% in 2023, and 4% in 2024 NHS BSA (2023a), NHS BSA (2024).

based on individual needs and risk factors, and removing barriers for using the extended team of dental professionals (specifically dental therapists) in a GDP setting. Some changes were also focussed toward the commissioning of dental care, ensuring there is the flexibility within the system to reallocate unspent funds in practices which are performing well. These changes came into effect in October 2022.

Since the 2022 tweaks were announced, two significant milestones specifically relating to NHS dentistry in terms of policy have occurred: firstly, a health select committee was formed to investigate issues related to NHS dentistry and secondly in early 2024 a Dentistry Recovery Plan was announced (Department of Health and Social Care and NHS England, 2024). Section 2.6 will give an overview of present-day dentistry and oral health in England, including the impact of COVID, and how the recovery plan intends to address these.

2.5 Workforce wellbeing

This section will offer a brief insight into the wellbeing of the workforce as it is an important contributor to the landscape of present day dentistry in England. Stress has often been cited as an issue for the GDP workforce however this is not a recent phenomenon, with data collected as early as 1980 indicating high stress levels within the dental profession (Cooper, 1980). There is evidence to indicate that wellbeing decreases when more time is spent in NHS provision (Denton, Newton and Bower, 2008; Myers and Myers, 2004). However, there is contrasting research which indicates that wellbeing (when measured across self-perceived health and health-related behaviours) is no different in dentistry to other professions – with the exception of increased alcohol consumption (Kay and Lowe, 2008). The data reported from Kay and Lowe (2008) was actually collected in 2005, so pre-dates the 2006 system reform which came into effect in April 2006, whilst the data collected by Denton, Newton and Bower (2008) was collected in the first week of June 2006. Burnout appears to be an increasing trend within the dental profession, with Denton, Newton and Bower (2008) identifying 8% of their sample experiencing severe burnout, with a further 18.5% at risk, whilst Collin *et al.,* (2019) found this to be 87.72%. Furthermore, their life satisfaction, life worthwhileness and happiness was lower than the general population, whilst their anxiety was found to be higher (Collin *et al.*, 2019). Whilst the measures of burnout are different (Collin *et al.,* (2019) uses the Oldenburg Burnout Inventory, and Denton, Newton and Bower (2008) use the

Maslach Burnout Inventory-Human Services Survey) the difference between the two time points is striking, whilst the additional evidence regarding life satisfaction and anxiety when compared to Kay and Lowe (2008) certainly indicates a decrease in workplace wellbeing since 2005.

When examining the causes of stress within the workforce there is a degree of consistency across data collection periods, with Kay and Lowe (2008) finding patient demands, practice management/staff issues, fear of complaints/litigation and non-clinical paperwork were sources of stress for over half of their respondents. Myers and Myers (2003) also found the dentist-patient relationship to be a significant work-related stress factor whilst Collin *et al.,* (2019) found litigation, dissatisfied patients and regulation to be prominent contributors to stress. Some studies have found that the position within the practice may contribute to the level of stress felt, with principals reporting increased time pressure when compared to other members of the dental team whilst salaried members of staff in managerial roles primary dental care were less likely to report low morale compared to clinical members of staff (Salazar *et al.*, 2019).

2.6 Present day dentistry in England

The above sections have addressed dentistry in terms of its contractual arrangements and workforce reception. This section describes dentistry in the landscape of COVID-19, access, and inequalities. It is also important to acknowledge the rapidly changing environment in which health services exist. Whilst global events, which alter the landscape in which the healthcare services exist can – and do – happen, there is also the fact that the NHS is not completely devolved from government. At the time of writing, since starting this thesis in 2020 there have been three Prime Ministers (Boris Johnson, Liz Truss and Rishi Sunak), with a general election upcoming in 2024. As each PM generally appoints their own cabinet and ministers, this means there has been at least 3 ministers charged with the responsibility of NHS dentistry. Not only this, but the responsibilities of each minister can change with each appointment. Furthermore, the Chief Dental Office and both deputies have resigned in recent years. Since 2012, PCTs have been abolished, replaced with Clinical Commissioning Groups (CCGs), which have now been replaced by Integrated Care Boards (ICBs).

The responsibility for NHS dentistry has shifted between numerous individuals, working under different administrations operating in reformed organisational

structures. Consequently, it can be hard to identify where the responsibility and accountability for NHS dentistry should fall, and difficult for people holding these positions to devote the time necessary for considered change. Another disruptive factor which should not be overlooked, and has an ongoing legacy, is COVID-19.

2.6.1 2020: Coronavirus and dentistry

When the COVID-19 outbreak started in 2019 the repercussions for oral healthcare services were unclear until urgent action was required. On the 25th of March 2020, a letter was sent outlining immediate changes to dentistry to help limit the spread of the disease. Non-urgent dental care was deferred, GDPs were asked to establish telephone triage services and provide dental care in urgent dental care sites where necessary (Office of the Chief Dental Officer England, 2020a). The letter emphasised the need for resumption of dental care with safety precautions, including the use of Personal Protective Equipment (PPE) and Infection and Prevention Controls (IPC) on the 8th of June. They also issued advice to prioritise patients with urgent needs and those in vulnerable groups, however with considerations of the capacity of the practice. The later issued Standard Operating Procedure (SOP) would stipulate about fallow time and limits in relation to Aerosol-Generating Procedures (AGPs) Ultimately, what this means is that when dental services did resume, their capacity was limited. Whilst limits on the volume of AGPs were adjusted, the requirement to have fallow time after a AGP remained until December 2021 (Office of the Chief Dental Officer England, 2020b). Whilst dental services can now be considered 'back to normal', meaning all restrictions have been lifted, there are issues with accessibility which are often framed as a repercussion of the pandemic as services have not returned to pre-pandemic levels (Williams, Fisher and Edwards, 2023). This is documented in the next section.

2.6.2 A crisis of access?

Whilst NHS dental services remain to be subsidised for all, and free at the point of use for those under the age of 18, under 19 and in full time education, pregnant or within the first year of childbirth, or receiving low income benefits, this is dependent on having – or being able to find – an NHS dental practitioner. A Health and Social Care Committee published a report in 2023 identifying access and the consequent impact on oral health as the core issue facing NHS dentistry (Health Social Care Committee, 2023). The report also notes the dissatisfaction within the profession,

specifically that even significant change may not be enough to draw dental professionals who have left the NHS back in.

Data from the General Practitioner (GP) patient survey in 2023 indicated that 77% of respondents who tried to get an NHS dental appointment in the last two years were successful, but they also reported that 47% of respondents had not tried to get an appointment with an NHS dentist (NHS England, 2023). The NHS BSA recently reported that over 50% of adults had not been seen by an NHS dentist within a 2 year timeframe (the recommended maximum time between appointments for a routine check-up), whilst reporting from the British Broadcasting Corporation (BBC) indicated that only 1 in 10 NHS dental practices were accepting new patients (BBC, 2022). The 2023 annual report for dentistry indicated 7 million fewer people accessed NHS dental care in 2022-2023 than pre-pandemic (2019) (NHS Dental Statistics, 2023). All of these metrics indicate a decrease in NHS services since 2020, which, given demand is unlikely to have decreased in this 4 year period, indicates unmet need (Williams, Fisher and Edwards, 2023). In a two year period, 18.1 million people were seen by an NHS dentist and the total spend was £3.1bn for 2021/22 (Garratt, 2023; NHS Dental Statistics, 2023).

Another key issue identified in the 2023 Health and Social Committee report was the inequalities associated with access, as people from more deprived areas, those who are exempt from payment, and marginalised communities are more likely to experience difficulties accessing dental care (Health Social Care Committee, 2023). Inequalities in oral health are prevalent, and persistent, across the life course, according to both clinical indicators and quality of life measures (Public Health England, 2021). Furthermore, these existing inequalities are thought to have been exacerbated by COVID-19 with those from deprived backgrounds less likely to resume dental services, and less referrals for children from deprived areas to secondary care when compared to pre-pandemic levels (Stennett and Tsakos, 2022). A recent report from Healthwatch found that only 22% of those who were financially struggling felt like they would be able to access NHS dental services in an appropriate timeframe, whilst this number was 38% for the financially comfortable (Healthwatch, 2023). These figures highlight both issues discussed in this section: that timely access to NHS dentistry is a prevalent issue, and that those who are financially worse-off are often disproportionately affected.

2.6.3 Governmental Response: The Dentistry Recovery Plan

Announced in February 2024, the dentistry recovery plan outlines a plan to 'recover and reform NHS dentistry' with the explicit aims of preventing poor oral health, improving access and activity, and supporting and developing the workforce (Department of Health and Social Care and NHS England, 2024). Whilst the 2023 select committee report proposed abolishing the UDA system and replacing it with weighted capitation, the recovery plan retains the UDA payment structure but increases the minimum payment to £28 per UDA. Additional payments of £15 or £50 are available per new patient seen by a NHS GDP, with the amount determined by the patients need. To help target isolated and deprived communities, mobile dental vans will be deployed and 'golden hello's will be issued to 240 dentists who choose to work in areas which are currently being under served by NHS dentistry. A new programme, Smile for Life, will be launched with the intention of first supporting expectant parents, ensuring oral health is incorporated from infancy (Department of Health and Social Care and NHS England, 2024). Water fluoridation and fluoride varnish issued by mobile dental teams to schools in deprived areas will be provided to support this.

The reception to the proposed changes has been mixed. Whilst some welcome the changes and see the benefit in having additional payments for new patients, there is still a rhetoric that the changes do not go far enough: there is still no registration for patients, and the UDA system remains (British Dental Association, 2024; Healthwatch West Sussex, 2024). Given these changes will start in March 2024, it is not possible yet to tell what impact these changes will have on the availability and utilisation of NHS dental services, and on oral health inequalities.

2.7 Chapter summary

This chapter has introduced key economic concepts which will underpin the consequent chapters of this thesis. Furthermore, the demand and supply elements of dental care have been discussed alongside the current climate in which the oral healthcare exists.

The following chapters will address the key issues facing NHS dentistry of what influences the workforce when making labour decisions, and why these are coming to fruition now, alongside qualitative and quantitative exploration of the public priorities for NHS dentistry.

Chapter 3: Shared qualitative methods

3.1 Introduction to qualitative section

The following two chapters take a qualitative approach to exploring the NHS dental care system from the perspective of people who provide, fund, and use dental care in England. These the chapters are split according to perspective with the first addressing the dental professional's perspective on the oral healthcare system, in particular the factors which they consider when deciding to contribute their labour and why issues with NHS oral healthcare are particularly prevalent in the current climate. The second qualitative chapter is from the perspective of members of the public, taking a broader stance regarding what NHS dental services should be – with regards to what oral health is, what should be paid for, by who, and who should make those decisions. These chapters fundamentally address different questions, with one examining lived experience of supplying dental services, whilst the second takes a more philosophical stance of the purpose of nationally-funded oral healthcare system. Each chapter therefore has its own independent framework, and whilst the supply of oral health services is not independent of the purpose of the oral healthcare system, there is a distinct difference between the two: one examines past and present issues with providing dental care, whilst the other looks toward desires for dentistry.

The decision to keep these perspectives as independent analyses and therefore distinct chapters was chosen because combining both the public and professional perspective in a single chapter, or merging the samples and creating chapters centred on themes, would encourage comparison between the two samples. Keeping the two samples separate means that observations can be drawn from within the samples, instead of across the two, meaning the full range of opinions of the members of the public and dental professionals can fully be explored. Naturally, when overlap does occur comparisons and parallels can, should, and ultimately will, still be drawn across the samples but this synthesis will occur in the discussion which happens in the discussion chapter of this thesis (Chapter 8).

To avoid repetition between chapters and for brevity, common aspects relating to the ontological and epistemological stance of the research, and shared qualitative methods will be discussed here. Sample-specific methods, such as recruitment mechanisms and topic guide development, will be discussed in their respective chapters.

3.2 Ontology & epistemology

Ontology and epistemology refer to the philosophical ideas of what can be known as an objective, independent reality, and how we interpret and understand phenomena (Ritchie *et al.*, 2003). The ontological stance of this thesis is best described by realism, specifically critical realism. Critical realism describes a state where the ontological experience of being, and doing, cannot be constructed but can be observed, focusing on the experience of the individual and not the 'reality' of the scenario which can be constructed through empirical data (Alderson, 2021). This was chosen as although empirical data exists regarding treatments delivered – i.e. what treatments individuals receive can be independently observed – how they are delivered, the experience of the patient, and how this meets their expectations is unique to the individual. With regards to the epistemological stance the following work takes the stance of an interpretivist, and the data is analysed inductively. Interpretivism acknowledges that whilst an event may be singular, the experience of the event by an individual is not universal, that lived experience, socio-demographics, personal beliefs impact how things are interpreted and experienced (Alharahsheh and Pius, 2020). This highlights the importance of purposive sampling and diversity within samples. Inductive data analysis tries to understand the social world of those engaging with data collection and their thoughts, opinions, and experiences drive consequent analysis (i.e. the analysis is not hypothesis-driven) (Thomas, 2006). Before engaging with the data however it is important to consider the analytical lens of the researcher. This is discussed in the following section, sensitising concepts.

3.3 Sensitising Concepts

It is important to consider the role of the researcher as part of the data collection and analysis process before engaging with the framework as I, the author, who composed the topic guide, conducted the interviews, formed the framework and analysed the data, come from an academic and research background where my education and skills have been predominantly economics focused. I have studied economics in some form, with various intensity, since 2008 and began working professionally as a health economist in oral health in 2016. Concepts which are common in economics and health economics are identified inductively throughout the data which may or may not have been raised or developed as themes by researchers without similar professional and academic backgrounds. Blumer (1954) describes this as a sensitising concept, meaning *"a general sense of reference and guidance"*

and others note how sensitising concepts are often – implicitly or explicitly – the basis of analysis in qualitative data (Charmaz, 2000; Gilgun, 2002). To be clear, the data was not analysed deductively centred on quintessential economic concepts of labour, supply and demand. Yet, it is important to acknowledge that the lens through which the analysis has occurred is that of the author: an economist.

3.4 Common methods: data collection

All data was collected online using the platform Zoom. This was for a multitude of reasons, and it is important to note that when data collection started in early 2021 there were still restrictions and health concerns regarding COVID-19. Online data collection also had strengths in relation to the flexibility for both the interviewer and interviewee, as removing the need for travel meant interview time slots could be offered starting at 9:00 in the morning with the final slot for the day commencing at 19:00. This meant interviews could fit around the participants work schedule or other commitments. Alongside the enhanced flexibility, online interviews can provide a more private and comfortable setting for the research participant if they choose to undertake the interview in a familiar setting such as their own home, or in their dental practice, which could encourage a more open and honest interview.

3.4.1 Data collection

All interviews were 1-to-1 between the author and interview participant, using a semi-structured topic guide which evolved throughout the interview process. Focus groups were ultimately decided to be unsuitable for both the dental professional and public samples. For dental professionals, as individuals work in the same sector they are potentially identifiable to each other hence risking the anonymity of participants. Even in situations where they are unknown to one another, they may filter what they say in case of repercussions or may choose not to disclose issues for fear of data leakage or judgement from their fellow participants. For members of the public, the consideration was more practical. Data from the interactions between focus group participants surrounding discussions such as what they consider important in terms of NHS dental care, how it should be paid for and who should be eligible would have been interesting to collect, however when the topic guide was piloted in an interview format it became clear that the time it would take to get through the content in a focus group format would exceed two hours, potentially causing fatigue and less engagement with the later topics. For both groups, focus groups can be vulnerable to dominant opinions and voices. Although this can be managed by the chair, by using

an interview format each participant is able to answer and explore every topic to the extent which they want. The topic guides for the dental professionals and public sample are distinct and discussed more in their respective Chapters (4 and 5).

Each interview was recorded using both the Zoom integrated software and remotely using a Dictaphone to ensure all data was captured. Zoom also provides integrated software which generates transcripts of interviews shortly after completion, which enabled rapid review of interviews. This was required to provide opportunities to review the transcripts and evaluate the topic guide between scheduled interviews. Each participant was assigned a randomly generated code, consisting of one letter of the alphabet and three digits. Using these codes, the audio files were sent to a professional transcription company, The Transcription Company UK, who produced verbatim transcripts whilst operating under a confidential agreement. These were then reviewed and de-identified by the author to ensure participant anonymity during data analysis. Participants were then allocated pseudonyms using age and culturally appropriate names to help humanise the data, and to help the reader follow each participants unique viewpoint and opinion throughout the analysis.

3.4.2 Data analysis

For analysis of this data, a framework approach was chosen. The use of framework analysis allows deviating cases to be presented alongside more common viewpoints so the breadth of opinions present in the data is encapsulated in the analysis (Gale *et al.*, 2013; Ritchie *et al.*, 2003). The following analysis for both chapters is inductive, the framework and themes were built as a result of the topics discussed in the interviews. The respective frameworks were both developed following the same, general stages. After data had been collected and transcribed, the author read over each transcript to refamiliarize themselves with the data. Detailed, hand-written notes were also made by the author at this stage. Transcripts were then initially coded closely by the author to describe the data using NVivo 1.6.1. An example of these initial codes is provided in Figure 3.1:

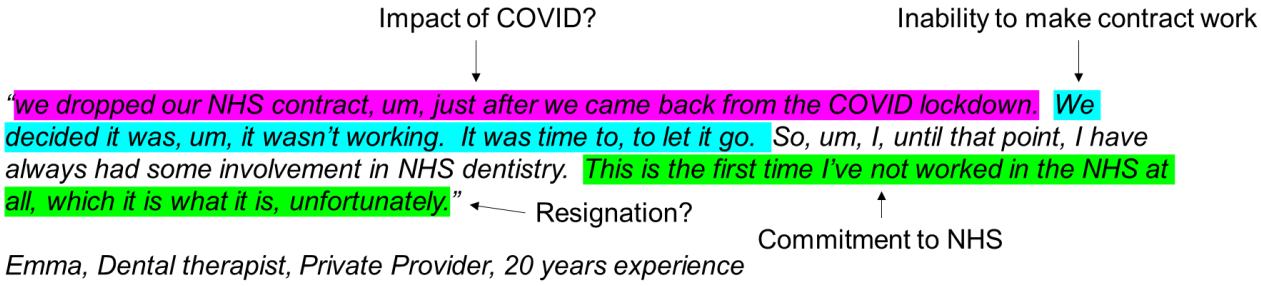

Figure 3.1: example of close coding qualitative analysis

These descriptive codes were then exported to Microsoft Word, reviewed and grouped to develop initial themes by the author. These were then reviewed and discussed by NR, CRV (who are the academic supervisors associated with the qualitative aspects of this thesis) and the author.

A selection of transcripts were sent to NR and CRV, and regular meetings were held to review the data and refine the framework and themes. The framework continued to be developed through the data analysis process if the author or the wider team felt there were themes not captured or represented in the framework.

3.5 Chapter summary

This chapter offers an introduction to the qualitative methods used in Chapters 4 and 5, specifically the data collection methods and analysis techniques used as these are the same across both qualitative studies. The author approaches the data using a critical realist approach and analysis is conducted inductively. These methods mean the analysis recognises the difference between participants and their thoughts, opinions and lived experience and as the analysis is data-driven, consequently these are reflected in the framework. Data is collected remotely for both studies in a 1:1 interview format, and all data is analysed using a framework approach for both cases. Separate frameworks for the dentists and the patient/public participants are chosen to reflect the breadth of the issues discussed. The following Chapters, 4 and 5, build on this Chapter and also describe methods specific to each study such as recruitment and topic guide development.

Chapter 4: Public or private oral healthcare provision: factors which impact dental professionals' decisions on where to work

4.1 Introduction

The background chapter, Chapter 2, has provided several metrics which indicate the workforce is increasingly choosing to provide private care, and the consequences this has had on access to NHS dentistry for the population. The first part of the analysis in this Chapter provides the perspective of the dental professionals on factors which impact the decision on which sector to work in. The second part of this Chapter explores why these issues are creating a shift toward the provision of private care in the current geopolitical climate.

4.2 Aims and objectives

The central aim of this chapter is to understand, from the perspective of the workforce, what factors into the dental professional's choice when deciding where to provide their labour with respect to the NHS and private dental care sectors in England, and why dental professionals are increasingly choosing private provision. The objectives are as follows:

- To identify the different factors which influence the sector (private or NHS) that dental professionals want to work in
- To understand why oral healthcare professionals are increasingly choosing to work in the private sector

The focus is predominantly on primary dental care, but the data also explores some aspects associated with secondary care (for example, skill development, job security, and income stability).

4.3 Methods

This section will describe the development of the topic guide, the piloting process, inclusion and exclusion criteria for the sample and finally recruitment mechanisms. Methods regarding data collection and data analysis can be found in Chapter 3.

4.3.1 Ethical approval

Prior to data collection, ethical approval was granted from the Health Research Authority (HRA) (reference number: 279839).

4.3.2 Topic guide development

The topic guide was developed following a review of the literature, with core texts such as the Steele report, and grey literature such as published information about NHS dental contract reform and blogs posted by the BDA – for example, see: (British

Dental Association, 2022; Rooney, 2018; Steele, 2009). Considering this wide range of sources was essential to develop a topic guide which was sensitive to the issues felt by the profession, but also to stay up-to-date with contract reform given a continually changing landscape. To reflect this, the topic guide was evolving and therefore continually developed throughout the interview process. Notably, during the data collection period (July 2022 – September 2022) an amendment to the NHS dental contract was made which changed the payment structure to dentists (NHS England, 2022). The evolving topic guide meant subsequent interviews could engage with discussions about the changes, exploring participants opinions and potential impact of these changes (often referred to as 'tweaks'). The final iteration of the topic guide is available in the Appendix A.

4.3.3 Piloting

The topic guide was piloted twice with dental professionals, one who worked in a GDP offering both private and NHS dental care (referred to as a dual or mixed practice from hereon), and another trainee working in secondary care with GDP experience.

4.3.4 Sampling

It was important to interview a wide range of dental professionals to attain a comprehensive overview of what motivates dental professionals to supply labour in the different oral healthcare sectors. The following inclusion and exclusion criteria were used:

Inclusion criteria	Exclusion criteria
Dental professional currently providing oral healthcare	Offering dental services outside of England
Dental practice based in England	No more than one person from the same practice will be interviewed
	Dental nurses

Table 4.1: Inclusion and exclusion category for interviews with dental professionals

To ensure a diversity within the sample this was supplemented with additional purposive sampling criteria. This was split into primary and secondary considerations, where primary considerations were as follows: sector of work (NHS, private, mixed), role in dental team, years practising dentistry and geographic region. The sector of work included Community Dental Services, (CDS), which is an NHS service offered

to people who would otherwise be unable to receive dental care in a GDP or secondary care setting. Secondary criteria included age, gender, ethnicity and the Index of Multiple Deprivation (IMD) associated with the practice. The IMD is composite measure of income, employment education, health, crime, barriers to housing and services and the living environment generated for small areas. Based on the items listed, each area is given a score and areas can then be assigned to deciles in order of score (where decile 1 is the most deprived and 10 is the least). Given the link between deprivation and oral health needs, the IMD of the practice was thought to provide some insight into the oral health needs of the local population.

4.3.5 Recruitment

Several methods were used to circulate the opportunity to dental professionals. The Northern Dental Practice Based Research Network and the British Association of Dental Therapists both circulated a short description of the opportunity to their members, who, if interested were asked to complete a form with the information relevant for the sampling. The opportunity was also posted on the project-specific Twitter (now X) account, where interested parties were asked to complete the same form.

When sampling was completed, participants who were selected were emailed more details regarding what their involvement would entail and a copy of the Participant Information Sheet (PIS), and, provided they wanted to continue their involvement they were asked to complete a consent form. Example of both these documents are provided in the appendix (items B and C respectively). In order to receive a payment for their involvement, participants also had to undertake a Right to Work check by the University. Participants were offered £100 for their participation, as outlined for two hours work according to the BDA guild rate. This was paid via the University after interviews had been concluded.

4.3.6 Study Sample

71 participants registered interest, with 20 being invited to interview based on fulfilling the purposive criteria. Only 17 took part, with three not responding to the initial invitation to interview and subsequent follow-up emails. It was decided not to invite additional participants to replace these non-responses, as the volume and depth of data from 17 interviews was thought to be sufficient. Table 4.2 displays the demographic information of the participants, with pseudonymised identities. The order is chronological, with a line to indicate when the tweaks were announced.

Interview length ranged from 1 hour 23 minutes to 2 hours 33 minutes with an average length of 1 hour 51 minutes.

Name	Gender	Age	Ethnicity	Care sector	Region	Years practicing dental care	Role	Practice type	IMD of employment location
Start of data collection: 10th of July 2022									
Chris	Male	45	White	GDP	East of England	22	Practice owner/dentist	Dual	1
Daniel	Male	30	White	GDP	North West	7	Dentist	Private	6
Ryan	Male	25	White	GDP	London	1	Foundation Dentist	NHS	4
Kimberly	Female	28	Mixed/Multiple ethnic groups	GDP	Yorkshire and the Humber	5	Dental practice manager	Dual	2
Mina	Female	56	Asian/Asian British	GDP	London	32	Principal Dentist	Private	4
19th of July 2022: tweaks to the dental contract announced									
Helen	Female	28	White	CDS	East Midlands	5	Dentist, community dental officer	NHS	5
Simon	Male	58	White	GDP	South West	35	Dentist	Private	5

Lisa	Female	51	White	GDP	East Midlands	27	Dental associate	Dual	6
Krish	Male	35	Asian/Asian British	GDP	West Midlands	12	Dentist	NHS	4
Serena	Female	24	Asian/Asian British	GDP	North West	1	Foundation Dentist	Dual	1
Anya	Female	58	Asian/Asian British	GDP	North East	30	Associate dentist	NHS	9
Grace	Female	26	Asian/Asian British	GDP	South East	3	Associate dentist	Dual	9
Rebekkah	Female	29	Black	GDP & CDS	North West	6	General dentist	Dual	4
Sara	Female	46	Arab	GDP	South West	13	Dentist	Dual	4
Emma	Female	46	White	GDP	South East	20	Dental therapist	Private	5
Paul	Male	40	White	GDP	North East	15	Dentist	Dual	8
Mark	Male	59	White	GDP	Yorkshire and the Humber	35	Oral Surgeon	Private	7

Table 4.2: demographics of dental professionals taking part in interview

4.4 Results

Figure 4.1 provides an overview of the framework developed for data analysis.

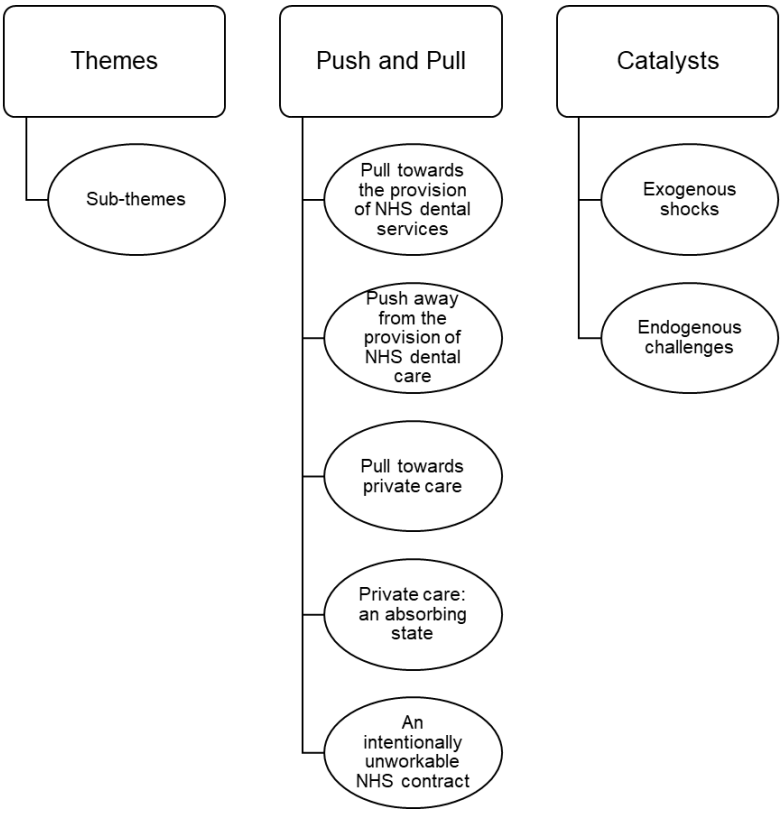

Figure 4.1: themes and sub-themes for dental professionals framework

There are two main themes and 7 sub-themes. The first theme, push and pull, is split into five sub-themes: the pull towards NHS dentistry, push away from NHS dentistry, and the pull toward private dentistry. Each of theme sub-themes contains several factors which will be presented in turn. The next sub-theme is a consideration of whether or not private care is an absorbing state (meaning that once dental professionals move to private care, they will not go back to NHS provision full-time). The final sub-theme 'An intentionally unworkable NHS contract?' examines one element of the push from NHS private care theme – the dental contract – and presents evidence from the profession regarding the design of the contract, and if it is intentionally a push factor.

The next theme, Catalysts, explores the contextual element, i.e. why the weight of the push and pull is drawing more labour toward the private sector in the past few years as evidenced in Chapter 2. It does this across two sub-themes: exogenous shocks and endogenous challenges.

These two themes address the two objectives outlined in section 4.2: firstly, what drives dental professionals toward the private or public dental care sector, or pushes them away, and why the balance of factors is tipping toward private provision in the current climate.

4.4.1 Theme: Push and Pull

The labour market that underpins the oral healthcare system in England is unique and complex, as demonstrated in Chapter 2. For the profession, this means that multiple things have to be taken into consideration when making decisions about where to provide their labour. The sub-themes contained in this section cover the different factors – both pragmatic and personal – that impact an individual's decision about where to provide their skills and time as an oral health professional.

The following theme draws upon the concept of push and pull from the literature regarding migration, which distils the complex process of deciding to move from a person's home country to somewhere new into a series of 'push' (issues about their home countries which compel them to leave) and 'pull' (desirable features which draw people to a new place) factors (Lee, 1966). Applying this concept to the decision-making process about where to provide dental care the following framework was developed:

- Pull Toward NHS dentistry
- Push Away from NHS dentistry
- Pull Toward private dentistry

However, as will be evidenced in the data, in the current climate private dentistry is often thought of as an absorbing state (i.e. those who start providing private dental care are unlikely to stop the provision of private dental care, and may in fact increase their provision of private care and stop their NHS provision entirely). For this reason, a push factor away from private care is not developed and instead this data is presented in the sub-theme 'Private care: an absorbing state?' as it allows for the consideration of movement between sectors, or lack thereof. The sub-themes can be thought of diagrammatically, as shown in Figure 4.2:

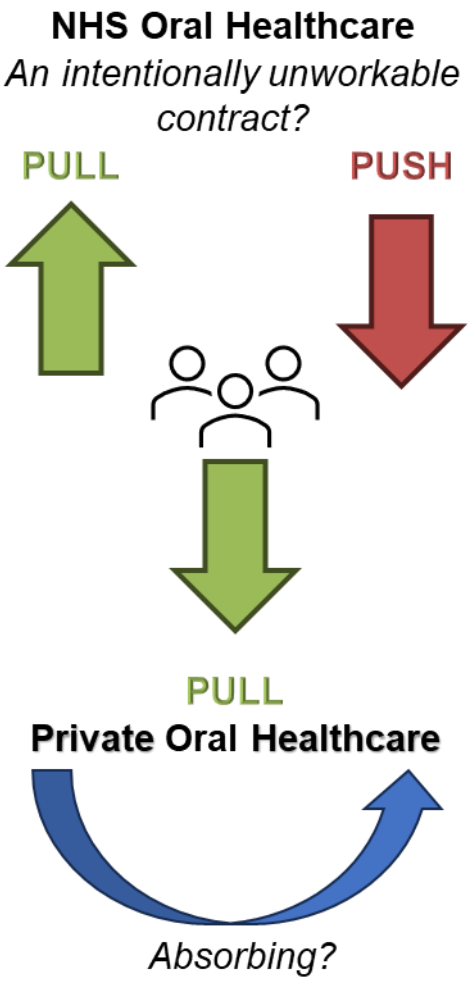

Figure 4.2: push and pull factors to the public and private oral healthcare sectors

The final sub-theme ('An intentionally unworkable contract?') is presented under the heading NHS oral healthcare as it underpins the notion of sustainability of the NHS oral health sector.

A small note about this framework: the implication should not be that oral health professionals work in either the private sector or the public sector, but instead this should be interpreted as a depiction of the balance between factors oral health professionals consider when deciding how much labour to provide to each sector. The issues which are discussed here are, to some degree, historic, i.e. they outline factors which have been an issue when deciding where to provide labour in the dental care market since the introduction of the 2006 dental contract, and were outlined in the 2009 Steele report (Steele, 2009). The circumstances which make this a pressing issue for the current climate, i.e. what is contributing to the present ongoing reduction in of NHS primary dental is discussed in the later theme 'Catalysts'.

As will be presented in the data, often the push factors from NHS dentistry are reflected as a pull factor toward private dentistry. This is not unique to dentistry and can be thought of comparable to job offers which outline salary expectations, responsibilities, and contractual obligations which impact how the day-to-day is spent. These factors lend themselves to being compared, and in the context of dental care, there is variation at the practice level. The largest source of variation however is within the sectors themselves due to the constraints of the (nationally standard) NHS dental contract compared to the relative freedom of private care.

Sub-theme: Pull towards the provision of NHS dental services

This theme discusses the aspects of NHS dentistry which are attractive to oral healthcare professionals and draw them toward the provision of NHS dentistry. These include both practical concerns, such as the availability of work, the stability of the job, and ideological concerns regarding equity.

Ideology

Starting with the ideological considerations, some participants reflected on how dentistry is an essential health service, and that NHS dentistry is the only accessible oral healthcare for people with low incomes:

> *"I really believe that a fundamental part of having a civilised society is that we have a healthcare system that looks after people erm, and I, I get a lot of value from treating people who are in need. I, I get a lot of personal satisfaction from that and especially knowing that they might not be able to afford it."*
> *Paul, dentist, mixed provider, 15 years experience*

Whilst Paul reflects that working with people who have great need is a rewarding aspect of the job, others note how they feel obliged to provide a public service after benefitting from a degree subsidised by public funds:

> *"I kind of think on the one hand we get loads of money put into us and our degree and so I kind of feel like there's like the social responsibility bit of it. But you know, you have taxpayers money that funds you to go and do this degree, so if you do your one year and then you go off and give everyone veneers that they don't really need then you're not really contributing very much to anyone."*
> *Ryan, foundation year dentist, NHS provider, 1 year experience*

The idea of obligation was raised by other participants, instead outlining how some practitioners feel they would betray their loyal patients if they moved to private sector work:

> *"[Some dentists have] been doing NHS dentistry since year dot, and they love their patients. And they feel that they would be disloyal to their patients, if they became private or stop doing it"*
> *Chris, practice owner and dentist, mixed provider, 22 years experience*

Unlike Ryan, Chris outlines that obligation is only a factor for those with an existing patient base, implying that new graduates would not feel tied to the NHS. Some reflected on the experience of treating patients who otherwise cannot afford care, but also notes that the educational aspect is particularly valued by these NHS patients:

> *"I see people who really can't afford it, who are surprised when I talk to them about basic oral hygiene and they're so grateful and receptive to that… I really, really did find that fulfilling."*
> *Grace, dentist, mixed provider, 3 years experience*

Compensation package

For some people part of the draw to NHS dentistry is the compensation package, with the NHS sector offering additional benefits and stability which cannot be provided in private dental care. This was particularly important for Krish, who spoke about the protection they have as an NHS employee with a chronic health condition:

> *"[I've had type one diabetes since childhood and as a result of that] there's very little option for me to have life insurance, I can't have income protection insurance, any of those kinds of things. So, the NHS superannuation offers me a little bit of that kind of, erm, you know, benefit… If I'm deemed unable to work, I can take my NHS pension early without, without penalty. So that's the reason why I've stayed in the pension, but to stay in the pension you have to work in the NHS."*
> *Krish, dentist, NHS provider, 12 years experience*

Other participants spoke about how income as an NHS dental professional is guaranteed (provided targets are met) and therefore has an element of stability, whilst the demand for private services can be variable:

"the NHS contract you think of it – you've got a definite amount of money coming in each year so that's – with a private practice the business model is a little bit more, you know, you are hoping and relying that all these patients are going to come in but there's no guarantee that you're going to get that money really."

Kimberly, dental practice manager, mixed provider, 5 years experience

Some spoke about their experiences working as part of a community dental service in the NHS, and how that gave them the stability of a salary but also meant their income was limited:

"the upside also to being a salary, a salary dentist in the community dental services is I knew how much I got paid every month. I didn't have to have an accountant. Er, but the downside was you didn't earn as much. I couldn't, I could never have cut my days down in the salary dental service"

Lisa, dentist, mixed provider, 27 years experience

Whilst from the practice perspective, one participant spoke about when the UDA value is high, you are able to cover costs and provide a profit:

"I worked out that if your NHS dental contract was high enough that it covered all the running costs of the practice and paid, enough to pay for all the dentists and there was a little bit left over, that you would have a good business there because effectively, effect, effectively just by doing your NHS contract, you would be making a profit"

Chris, practice owner and dentist, mixed provider, 22 years experience

Experience

Another pull is the volume of patients with treatment needs in an NHS setting:

"you need learn. You really need to learn. You cannot learn from private patient and that is not because – most of them, they don't have high demand. It's just mainly cosmetic"

Sara, dentist, mixed provider, 13 years experience

Talking specifically about their foundation year experience, one participant spoke about the freedom to take on complex cases and develop skills:

"I'm pretty happy to be in a high needs area. I think like I'm not someone that wants to really get out of the NHS… So it's kind of good experience to be

thrown in at the deep end and get all of the wild cases that take a lot of doing to sort out, at least at this point because we don't have – we do have targets, but they're not like associate level UDA targets. So you have much more flexibility to take on longer, more complicated cases."
Ryan, foundation year dentist, NHS provider, 1 year experience

However, the opinion that the NHS is the sector in which to gain experience implies that the private sphere is where you provide labour once you have established expertise, and therefore that the NHS and the patients being seen within the NHS setting may be receiving care which is of poorer quality, i.e. a two tier service. This dynamic was explored by one participant:

"It does seem to be that [graduates are] going into private practice. I don't know where they're learning, sort of honing their skills but it's not necessarily in NHS practice, and why should it be. I mean I'm not saying that you need to go into the NHS to learn your skill and practice it in a cheaper way. That would imply that NHS patients are a different and I don't think that that is what I feel."
Anya, dentist, NHS provider, 30 years experience

This reflects a tension about what paying for private care can, and should, afford you and whether it is acceptable to use NHS patients as 'practice'. Although this is not explored comprehensively in this chapter, the dynamic between the public and private oral healthcare market will be explored from the patient and public perspective in Chapter 5.

Sub-theme: Push away from the provision of NHS dental care

The following theme explores the push factors away from NHS dentistry, i.e. the aspects of NHS dental care which make working in this sector unappealing. Before discussing the evidence in this theme, it is worth noting that a lot of these factors are related to the NHS dental contract. Considering the volume of data collected regarding this issue, and the existing body of evidence regarding the shortfalls of the dental contract, the exploration of the dental contract will be relatively brief.

The 2006 Dental Contract

As discussed in Chapter 2, how dental services are contracted in England is based on the volume of treatment delivered, as measured by the UDA, with dental practices having a number of UDAs they must meet in a financial year with a corresponding

payment amount which may be subject to clawback if they under deliver. Whilst there are many issues with the dental contract, for brevity this section is limited to a discussion of the negative attributes which make the NHS dental sector difficult for the workforce, and thus pushes them away from NHS dental care.

As will be evidenced below, the UDA system can lead to a perverse incentive structure, where the main focus is meeting targets. However, underlying this, is the notion of time. Since dental contracts are annual, there is a finite time period in which to meet the contracted UDAs, and this can, but does not necessarily, create a time-pressured environment:

> *"What you do, like it's physically and emotionally quite draining. And then to feel like, you know, it's not necessarily just the UDA value, but then the targets that are pushed on you… I felt really pressured and rushed"*
> *Grace, dentist, mixed provider, 3 years experience*

> *"If I'm under target, I've never suffered. Okay, I've earnt less that year because I've not, I've done less UDAs, but they've never taken money off me… It's not something I've had to worry about. I always try to hit my target and I've always, sort of, you know, I've done extra hours if I'm behind. I've worked a Saturday morning or, you know, done an evening, that kind of thing, just to try and help because I don't want the practice to be short of, you know, its target, but erm, it's never been something that would keep me awake at night."*
> *Krish, dentist, NHS provider, 12 years experience*

The contrast between Grace and Krish highlight the importance of the individual practice with regards to feeling pressure, with one feeling like targets are 'pushed on you', whilst the other presents their situation as one of choice where they 'try and help' if the practice is behind. This demonstrates that contract management, as well as the contract itself, is important. Participants spoke about the challenges the contract create in terms of the treatments which are renumerated coupled with the time pressure detracting from patient centred care:

> *"time is not valued, erm, by the NHS, ok, so for me, if you come in worried about something and you wanted to spend 15, 20 minutes chatting to me about it, erm, I would hope most practitioners would do it but if you were coming in frequently, or all my patients were wanting to do the same and it was free advice, you're not going to hit your UDA target and you're going to*

get hammered."

Simon, dentist, private provider, 35 years experience

The quote from Simon highlights how it is the moral integrity of the dentist working under the NHS contract which impacts what care the patient gets, as opposed to consideration of what is best for the patient. One participant expressed frustration at this, noting that in the long-term, spending time can be effective prevention, and ultimately can mean less treatment and therefore is best, in the long-term, for the NHS:

"I mean how many fillings, how many fillings did the NHS have to pay for, for that which could have been solved with a t-, - a ten-minute proper conversation?"

Paul, dentist, mixed provider, 15 years experience

Others reflect that the dental contract was more suitable when it was initially designed in 2006, but the banding system has become antiquated and no longer reflects the needs of the population, the technology available to dental professionals today, and the time it takes to administer them meaning targets are difficult to meet:

"I think, you know, originally, in 2006, there was a lot more lab work going on [mmm] where you'd get more UDAs for; erm, a lot more bridge work and, and, and crowns erm, that you'd get er, remunerated for but as time has gone on, it's more minimally invasive. You're, you're not doing that kind of thing [right] and so the UDAs are harder to c-, come by"

Paul, dentist, mixed provider, 15 years experience

"I think that it has become, you know, as it's developed as we've been able to do more adhesive dentistry, more bonded work, you know what that means, less invasive treatments so not sort of drilling teeth down to nothing. I think that the NHS doesn't lend itself to that because there's more time involved, it's not about just bunging in a white filling, it's about using a good quality material, making it look nice, making sure it's correct in the bite. "

Anya, dentist, NHS provider, 30 years experience

When treatment is required, one participant notes that patients who are booked in for an NHS check-up need to be presented with all potential options – including private – in order to attain informed consent which is time-consuming:

"With the NHS, erm, check-ups, in theory you get less time because, you know, that's the way practices work… But the irony is you actually need a longer check-up for NHS patients because you have to give them the NHS options and you have to give them the private options. So inherently they're having a private check-up, but you are doing it under NHS conditions. So again, you know, to, to give them informed consent and to cover your back basically you are having to, to do private check-ups on NHS patients, so."
Lisa, dentist, mixed provider, 27 years experience

Spending the time in an NHS appointment to explain all treatment options is intrinsically linked both patient autonomy and to the threat and fear of litigation:

"[Litigation is] something that, like, terrifies every dentist daily, definitely… When I looked at, well, looked at litigation and stuff, it's like the majority of complaints are because of communication. And the reason there is poor communication is because, you know, either time pressures, or just, like, the dentist making a bad choice."
Serena, foundation year dentist, mixed provider, 1 year experience

Whilst there is more to investigate in relation to litigation, it is deserving of more exploration than can be afforded in this thesis. Others note that the UDA payments are not reflective of the time spent providing restorative treatment, and do not adequately reflect the volume of work done, which is not only unprofitable but can negatively impact morale:

"So if you're going to get 80 to 90 quid for providing six hours worth of care, if you're going to do it properly, if you're going to treat their disease and, and prevent further disease, then who's that going to pay? It's not even going to pay the dental nurse. It's not even going to pay the dental receptionist, so, let alone the surgery costs. So that means that patients aren't going to get the treatment they need."
Emma, dental therapist, private provider, 20 years experience

"Under the UDA system, of course, it's a flat fee and it's a flat UDA. So if a patient comes in and needs 10 fillings, you, as a dentist, get the same credit or the same payment as if a patient needs one filling. And that, for a lot of people, is quite disheartening because it makes you sometimes feel that you're not doing a lot of UDAs because you're spending a lot of time with

patients doing a lot of treatment."

Chris, practice owner and dentist, mixed provider, 22 years experience

Both of these quotes highlight how practitioners feel undervalued by the payment system outlined in the dental contract. The pressure felt as a consequence of limited time is not only affecting the dentist, but extends to the wider dental team too:

"[A lot of dental nurses] decide, 'Actually, it's not the career for me,' or it's – because it's a pressure. You work under pressure. As I said, you have sometimes – some our check-up is ten minutes. So you are now – in ten minutes… you have to clean the chair, do this, go do the instrument. It's a pressure. It's a pressure job."

Sara, dentist, mixed provider, 13 years experience

Furthermore, that the UDA banding system encourages quick, low-skilled work which ultimately means those who work solely in an NHS GDP setting are deskilling, and may be unsatisfied with the quality of care they are able to provide:

"you can get a patient in the chair for 10 minutes and do a quick patch-up job, but that's not the dentistry that, definitely not the dentistry I want to be doing and I would imagine not the dentistry most people really want to be doing."

Emma, dental therapist, private provider, 20 years experience

A wider consequence of the UDA system which was discussed was the impact on accepting new patients, with participants noting that the incentive structure means practices are wary of accepting new patients as their treatment needs are unknown and unpredictable, and could end up generating a net loss for the practice despite – or perhaps because – they are in pain:

"We have no incentive to see new patients, we have no incentive to see people who call up and say they're in pain. Presumably those patients that haven't got a dentist and are in pain, you know, some of them it's because they recently moved to the area or for whatever reason. But most of the time it's because they've either not turned up for their dental appointment so their dentist won't see them again. It's because they don't go to the dentist regularly so they're going to have a mouthful of problems that we've then got to sort out. Which potentially they might need 50 fillings or something like that and we get paid £65, well whatever we get paid for it, £90 or something if

we're on a £30 UDA contract. It's just not worth it because then you see the same patient, you know, you see one of your regular patients who might need a small filling on their back tooth and we get paid the exact same amount for it."

Kimberly, dental practice manager, mixed provider, 5 years experience

Some participants note how the UDA system complicates the use of the wider dental team, such as therapists:

"For me, when I've done my analysis of it, it's actually more cost-efficient for a therapist to just work as a hygienist and charge the patients privately for a hygienist clean. That was actually generating more revenue than him trying to do a few UDAs by doing some fillings and things like that."

Chris, practice owner and dentist, mixed provider, 22 years experience

This sentiment was echoed in the perspective from Emma, a dental therapist, who lamented the contract as creating barriers to being able to work effectively in an NHS GDP setting:

"The NHS contract put a barrier in front of dental therapists working properly… That's a failing in how the, the contract was designed in the first place… If the, if the barrier hadn't been there in the first place, you can guarantee that every practice would have a therapist doing at least all the kids' exams, if nothing, if not all of them. If you could have a therapist doing the exams, the radiograph and the pre, prevention and referring to the dentist the treatment they can't do, that can't… Well, it does work. I know it works 'cause it works in private practice. It, it, it definitely works, but if they'd not had that barrier there in the first place, that might be the situation we're in now."

Emma, dental therapist, private provider, 20 years experience

Whilst the previous quotes have mostly focussed on the UDA targets and the negative impacts they can have on those working in an NHS GDP setting, the following quotes examine the costs associated with providing dental care. This is an important consideration and is interlinked with renumeration – as Chris demonstrates – dental practices are ultimately businesses and therefore revenue must be considered:

"there are patients under the UDA system where it's almost better for you to give the patient 20 quid and say, 'Listen, you know what? Go and find another dentist', because the amount of time that you'd have to spend fixing all their teeth and doing, treating all their problems for what the NHS pays you, you're doing it at a financial loss, hands down. And, and that's, that's a difficult thing because what businesses operate like that? And at the end of the day, dentists, dental practices are small businesses"
Chris, practice owner and dentist, mixed provider, 22 years experience

Participants reflected on how the dental contract is unfair on the practitioner as the cost of providing care exceeds the UDA payment:

"Like sometimes, you do... you know, a single tooth denture, you know. It doesn't cost much, to be honest, like dental lab work [mmm] but you do two crowns, you do bridges and the patient's paying exactly the same amount when it's not fair, again, because now you are paying for material. It costs more and the more work from the technician side and the lab fee is higher."
Sara, dentist, mixed provider, 13 years experience

Sara continues to reflect that often the practice will get the cheapest materials to try and preserve profit margins, but this only focuses on short-term needs and creates a false economy for the NHS and conflicts with the patients interests, and her ideology:

"I work as associate. It's not my practice... the NHS give you a pot of money and they say, 'Okay, use it.'… I'm asking for material for £300, of course, nobody will order it for me. When I want – I want to have the best because I feel like this is what's going to best – you know, for – I look for, as I said, long investment but I'm afraid the mentality with the NHS is a cheap economy. We order the cheapest bond. We order the cheapest composite, the cheapest amalgam… You cannot blame them. It's – end of the day, as I said, we all have bills to pay. We have responsibility, we have family. If I'm going to o-, - it's not a charity work."
Sara, dentist, mixed provider, 13 years experience

Other participants spoke about the responsibility they felt as an associate to deliver quality of care to their patients, and as a result directly purchasing their own equipment and materials so they are able to provide better NHS dentistry:

"I buy the files myself [for root canal treatments]. The principal doesn't buy them, so I, I buy the stuff. I've got a microscope that I kind of bought myself as well [mmm] so I can do it even better… I'm trying to do the patient a favour by saving that tooth. I'm trying to do the NHS a favour by, you know, trying to preserve the dentition erm, and – erm, and, you know, you feel stuck in the middle between these two, two different forces."
Paul, dentist, mixed provider, 15 years experience

"I have spent a lot of money, down the years, purchasing me own materials, because the ones provided by the practice, I felt, weren't adequate. So I took that on the chin. I would buy different materials, different, you know, instruments, bits of equipment, so that I could do the dentistry to the standard that I wanted. I think I'm very much in the minority, from that point of view. And, again, the patients didn't necessarily know that they had a top-of-the-range, you know, filling material in their mouth, but I could – I could, you know, sleep happy, knowing that that filling's not gonna fall out. [Mm]. It's gonna last them. They're not gonna come back, kicking off."
Daniel, dentist, private provider, 7 years of experience

These two participants in particular note the strain that can come with trying to provide the best – or, in the case of Daniel, acceptable – care for NHS patients, which in the long-term will also be fruitful for the NHS, but only possible by incurring personal costs. The wider implication is that acting in the patient's best interest is also to the advantage to the NHS, but under the 2006 contract the cost is borne on the practitioner.

Monitoring

Participants spoke about being monitored by the NHS, such as statistics being collected and compared without nuance:

"when they send through the reports… they have the red flags where there's, there's too many of this or too many of that. Erm, and I remember it didn't come up as a red flag but we were – you know, comparatively from the mean, you know, we were erm, saving too many teeth. Erm, so relative erm, to – the extractions were low and the root canal treatments were high and this looked like a – something that was quite different erm, and, and I'm kind of like, 'Really? Th-, this is what we're measuring?' You know, where it should be

something that – that's rewarded rather than kind of flagged up as a variable."
Paul, dentist, mixed provider, 15 years experience

Paul identifies how comparing to the average performance of practices can mean you are at risk of being unfairly penalised in scenarios where practitioners are putting the patient interests above their own concerns, providing restorative treatments when other practitioners choose to extract. Others speak about the implication of this, how they feel they are ultimately always treated with a sense of distrust:

"I'm not sure if there's some way of, you know, we are always treated with such suspicion and with any contract there's always, how can someone sort of like, you know, diddle the contract, how can someone take advantage of it."
Kimberly, dental practice manager, mixed provider, 5 years experience

"a minority within the profession have taken advantage of a system. Well my view is you cannot develop a system based on the lowest common denominator you cannot, just because there's a couple of charlatans out there."
Simon, dentist, private provider, 35 years experience

Bureaucracy

Another negative factor associated with NHS dental care was the bureaucracy involved with having an NHS dental contract. One participant spoke about the administrative burden involved with a small contract, noting that it was not proportionate to the volume of the contract itself:

"I had the interview with NHS, they said to me that yes, it was a bit of a shame because even if somebody who had a lot of UDAs, the paperwork they would do is the same paperwork we do for a small contract that we have… it doesn't matter how big your contract is, you've all got to do that paperwork. So, I was spending a disproportionate amount of time on a smaller UDA contract rather than focussing on the care that I give the majority of my patients."
Mina, practice owner and dentist, private provider, 32 years experience

Disconnect between those working within the system, and decision makers

This theme documents a feeling of frustration that the people who make decisions about NHS dentistry are often detached from the day-to-day delivery of care, ranging

from commissioners working to contract NHS dental services to the government of the day. One participant discusses the punishing aspects of clawback, but in particular how previously a continued working relationship between the PCT and dental practice meant if targets weren't reached there was a degree of empathy:

> *"I think they've now said well if you're in breach of under 96[%] after three years bang, we can take the contract… that's sending out quite a dark message and if I had the same relationship that I had 15, 16 years ago with my PCT, erm, I could trust the people there, I knew them face to face and I could sit there and say look, I'm really struggling to recruit and they'd say ok we get that, you know, we value what you've done over the last x number of years we'll help you, whereas now you're… you're not talking to someone face to face, you're not even doing it on Zoom, you know, you are lucky if you get a breach notice or whatever by email"*
> *Simon, dentist, private provider, 35 years experience*

This speaks to the willingness to listen and understand the root cause of the problem from the practice's perspective instead of immediately being penalised for not reaching targets. However, it also picks up on the feeling of being under-valued by the NHS which was also discussed in the push sub-theme regarding the dental contract.

Others reflect how decisions made by other parts of the organisation dictate what is available through NHS dentistry, but the responsibility to communicate this is often left to the practitioner:

> *"So, the minute you get into aesthetics, then you get into it, then it becomes a, a, a bit of a dilemma because the NHS are saying, "Well, we'll only get you to a point of functional, good use of your teeth." So, this is not something the dentist is saying. The dentist is saying, "Actually, you can have both. You can have function and you can have aesthetics." But if the NHS have suddenly gone, "Right, okay, now we're putting a line here, you can't send these children to us anymore to get their teeth straightened." Well, you know, what can we do"*
> *Mina, practice owner and dentist, private provider, 32 years experience*

As Mina highlights, this can lead to situations where they are offering patients NHS care which they deem to be inadequate. Some emphasised more specifically the role

of the government of the day and politicians, highlighting that decisions made by the government are often uninformed:

> *"I don't like politicians. I'm not a fan of politicians… Erm, and when it comes to dentistry, they don't have a clue."*
> *Krish, dentist, NHS provider, 12 years experience*

Both of these participants allude to decisions being made by the government which do not centre patient interests, yet that it is the profession who are responsible for communicating governmental decisions. Others speak about the relationship between the profession and the government, noting an erosion of trust in the government:

> *"I think we are misled by government and they are disingenuous with the truth and erm that because of that it's actually made things harder and more difficult so we actually all want the same thing but we end up fighting against each other and within our profession you see that through covid between the NHS and the private sector so you know there were sort of grenades getting lobbed from either side, both the NHS saying the private sector were being irresponsible and going back to work too soon and the private sector were accusing the NHS of being malingerers and err hiding behind the risks and that's where you turn on yourself and for the Department of Health that must be fantastic because it just takes the flak off them"*
> *Simon, dentist, private provider, 35 years experience*

Interestingly, this participant talks about how the NHS and private care sectors are often pitted against each other to promote in-fighting to detract attention from the core issue. The operationalisation of the profession by the government will be explored further in the sub-theme: 'An intentionally unworkable NHS contract?'.

Sub-theme: Pull towards the provision of private care

The following provides an exploration of pull factors drawing people to the private dental care sector. Some of these are an antithesis of what the experience in NHS dental care provides, for example whilst the push from NHS dental care evidenced the inability to spent sufficient time with patients, this theme will discuss the luxury of time available in the private sector.

Focus on patient care

Participants talked about the freedom providing dentistry in a private setting allows them in terms of being able to focus entirely on the patient's oral health needs:

> *"having that, you know, environment where you can do what's just entirely – you know, 'Okay, well, let's do this,' and not have to necessarily worry about what band it fits into means that you can really kind of focus on the patient rather than this, this kind of ridiculous algorithm in the background."*
> *Paul, dentist, mixed provider, 15 years experience*

> *"The reason I like private dentistry is because you can provide exactly what the patient needs, not what you're being paid to give that patient."*
> *Lisa, dentist, mixed provider, 27 years experience*

This in particular highlights the shift which happens in mentality over the NHS and private sector, and that in private care there is no 'worry' about optimising output and instead the focus shifts to ensuring the patients are able to get what they need. Furthermore, practitioners have a greater number of options which they are able to provide patients with in order to meet their needs:

> *"it just gives them more options on say what type of denture they have or what type of crown that they have or yeah, wanting sedation so, say if you were on the NHS, you would have to meet certain criteria to get certain like sedation or something like that whereas, in a private practice, it might be just, 'oh, you want it then' that's okay."*
> *Helen, dentist, community dental service (NHS), 5 years experience*

However, being in a private sector with greater clinical freedom – and more options available – is also considered to be a *push from* private care for some participants. Anya and Grace both discuss how the clinical freedom can lead to a lack of alignment between the type of care a practitioner wants to provide, and what is being asked of them by their patients:

> *"[In private care] I think that expectations are much higher, er, quite rightly so if you're having a lot of sort of aesthetic work done, so cosmetic work done… I don't always want to practice that kind of dentistry, that wasn't really what I was trained to do. I'm more about healthcare than beauty."*
> *Anya, dentist, NHS provider, 30 years experience*

“I like bread and butter, like getting patients out of pain, doing a small bill that's not, like… an amazing, but crazy smile makeovers.”
Grace, dentist, mixed provider, 3 years experience

Another participant noted that as a consequence of decreased access to NHS dental care, more people were using private care but there is a distinction between the patients who use private care out of choice, and those who are using private care because they cannot access NHS:

“the private patients I’ve got are kind of private because they have to be private at the moment cos they can’t access an NHS dentist… I am finding it’s a bit, I get a bit stuck when they’re like ‘well, I want this option, I think it’s the better option, but I can’t afford it, even on finance’ so, then, you’re a bit stuck then so, sometimes you have to do compromised treatment plans to fit in with budgets I am finding.”
Rebekkah, general dentist and community dentist, mixed provider, 6 years experience

Compared with the other quotes, it’s interesting to observe that the environment in private care enables dental professionals to focus on patient care, the ability to act in the patients best interest can still be limited by the same factor: budget constraints.

Freedom

As there is no set fee structure in the private dental care sector, dental professionals have the ability to take home more pay providing dental care, with participants comparing their earnings between the two sectors:

"I am finding that I make more money seeing fewer patients and spending longer on them “
Rebekkah, general dentist and community dentist, mixed provider, 6 years experience

“I mean most of my friends who work in private practice say, I don’t know how [you work in NHS practice]. I say well I do it because nobody’s chasing my tail to earn any more money. But when I look at the money I earn… I can’t believe I’m on half the salary I was when I worked [in private practice].”
Anya, dentist, NHS provider, 30 years experience

Anya's experience in relation to this analysis is considered a deviant case, and will be explored more in the sub-theme 'Private care: an absorbing state?'. One participant reflected concerns that the potential for high incomes in private dental care attracts people wanting to be high earners to the profession, as opposed to focusing on patient care:

> *"I think it's a bit scary because it's sort of unlimited. Um, so I do think that people who are, like, quite young like me, some of them are just drawn to the money and maybe forget about the patient."*
> *Serena, foundation year dentist, mixed provider, 1 year experience*

The draw of money within the private sector is not just about income, but the freedom it affords dental professionals. Participants reflect on the difference between private practice and NHS in terms of the time, and pressure, experienced and the ability to use the materials in their practice without concern about the availability of a resource, or that they were depleting a limited (costly) resource:

> *"I think the main thing for me is the time. I don't feel stressed and the material. I know when I ask for the material, because the patients are paying for their treatment, they're not going to say, 'Oh no, it's expensive,' or 'It's costly,' or, or 'Oh, it's not, it's not available because this is for NHS.'"*
> *Sara, dentist, mixed provider, 13 years experience*

> *"[In private practice] I can pick up an electric toothbrush, put a head on it, put it in their mouth, give them the head. I can pick up the right aids they need, find the right sizes, maybe try four different sizes to get the right size for one space and not worry about the fact that I've just used half a packet of interdental aids."*
> *Emma, dental therapist, private provider, 20 years experience*

Emma in particular highlights how this freedom allows them to meet the patient needs and ensure the patient gets the correct advice. Others identify the key difference as being the time they can spend with patients, leading to better patient care:

> *"it's the luxury of time. And within that window, the scope for communicating with the patients, being able to retain that information, learning about them, learning about their lives, like, erm, and also having the time within that to do*

admin stuff.“

Grace, dentist, mixed provider, 3 years experience

“you can spend more time with a patient and you get remunerated for that time, it’s more preventative focused, so you can actually spend time, or your hygienist or your oral health educator can spend time with a patient and get remunerated for it, whereas in the NHS generally you don’t.”

Simon, dentist, private provider, 35 years experience

Some argued that patients who pay for private care are more invest in their oral health, and therefore the patient base in the private sector is more receptive:

“from a private basis, not only have we found that the message of dentistry and oral health is much easier to get people on board because also we then get paid for our time, which is really important because what's the incentive to give people that message if you're not going to get paid for your time and your expertise? But patients also then obviously benefit from that because if it means that they’re healthy, they've got healthier mouths, they're going to need less doing. So, ultimately, it's a win-win situation.”

Mina, practice owner and dentist, private provider, 32 years experience

Participants spoke about the time and the materials afforded in private allowing them to do a better job and enabling them to perform to their potential as practitioners, thus having a greater job satisfaction:

“people don’t get the satisfaction from doing bad work, which I think is why people do go on to do private treatment and like being private because they feel like they’re doing a good job for their patients because they can use good materials, they have the time to do what they consider like a good job and that utility is then added to because of the good money that they get from doing private.”

Ryan, foundation year dentist, NHS provider, 1 year experience

Another participant talks not of the satisfaction of providing high-quality care, but of the variety offering private care can bring to their day-to-day:

“If you have a day of check-ups, you tend to be having the same conversation over and over and over again, which is why I started doing also braces again, because it's different. And also, you are doing something that somebody

wants, somebody wants that result at the end of it."
Lisa, dentist, mixed provider, 27 years experience

Interestingly, they also highlight a different aspect of job satisfaction: of feeling like they are providing a service someone actually wants and will appreciate the results.

Professional development

Another pull toward the private sector is the ability to develop skills and use them in clinical practice:

"I'm doing a master's [in restorative dentistry], and it was made clear to us from day one that the stuff that we're – that we're learning, you cannot do it on the NHS, because you won't make a living. So you've – I think you've – you've got the issue that people who are willing and able to do any further training/studying… you have then got little choice but to work privately."
Daniel, dentist, private provider, 7 years of experience

Daniel notes that the skills learnt are transferrable between sectors, but from a GDP perspective would be too costly to use in an NHS setting. Kimberly however notes that NHS care will benefit as a result of skill development:

"[One of our dentists has] been on the implant course, he's been on composite bonding courses, Invisalign courses, he's been - all of them now are currently doing this diploma in restorative and cosmetic treatment. But they paid for all that by themselves or we paid for it. That's not an NHS thing but then the NHS care that he's providing because he has that knowledge on say, you know, bonding and composite."
Kimberly, dental practice manager, mixed provider, 5 years experience

The use of the wider dental team is also viewed as easier in a private dental care context, with one participant discussing the ease of integrating therapists into private care:

"I think a therapist, even in the context of a private practice, would probably work quite well because the therapists can then charge what they want, and they can use what materials they want and take as much time as they want to. And I think trying to sort of get a therapist to fit into, like, an NHS model is quite difficult."
Chris, practice owner and dentist, mixed provider, 22 years experience

Sub-theme: Private care: an absorbing state?

The framework in the start of this theme (figure 4.2) suggests private care to be an absorbing state, i.e. once a practitioner switches to an entirely private model they will not return to the NHS. This is based on the data from the participants, for example Simon and Daniel:

> *"I just, in my experience… once you've gone to the dark side you are not going to come back, ok, particularly in the current environment. If the whole world imploded and there was no funding, no you know, inflation went through the roof and there was a huge crash and a recession, private dentistry would… the cosmetic stuff would probably take a hit, a lot of the rest of the private dentistry I think would still be reasonably secure"*
> *Simon, dentist, private provider, 35 years experience*

> *"If you were asking just me, strictly me, from a situational point of view, I am deliriously happy where I'm working now, so nothing would pull me back [to NHS dentistry]. But there isn't another private practice that I would leave to go to."*
> *Daniel, dentist, private provider, 7 years of experience*

However, Daniel also highlights that it is not just their working sector that they would be unwilling to change, but the practice itself, again highlighting how critical individual factors are to the decision about where to provide labour. Another participant spoke of switching from private dentistry to NHS, for practice specific reasons:

> *"I'd been in that private practice for 18 years… And then management changed so it was bought over by another couple of people who wanted the money to go up dramatically. And because I'd been there for 18 years I was not able to suddenly say to my stable patient base, you need whitening, you need crowns, you need more white fillings. So I left – I felt a bit, you know, I left under a cloud really in a very bad, with a very bad feeling... So I was private, I've gone back to being NHS and, er, I just quite liked it. And when I came to work with the people I work for now I just felt supported, valued so I stayed there."*
> *Anya, dentist, NHS provider, 30 years experience*

Anya highlights the personal conflict and the emotional strain they felt when faced with upselling their established patient base with treatments they deemed

unnecessary and unwanted, instead choosing to operate in a practice where they felt valued. They do however later reflect on the pull of money offered in the private sector:

> *"I would like more money and I do look at going to private practice, I do look to moving to private practice. But for me, similar sort of thing, I'm not really sure that I want to move, I like it where I am, they don't stress me out… So yeah, but for the time being I'm happy to stay put and supplement the salary, that's what I've decided to do, with doing more private work. But that will be at the expense of an NHS patient not being seen and that means we won't hit our target, that means they'll take the target back and little by little it will be eroded. Unless they do something fantastic to the NHS. "*
> *Anya, dentist, NHS provider, 30 years experience*

The decision to provide additional labour to the private care market will be explored in the next theme (Catalysts), in the sub-theme crisis of hope. However, this evidence in particular speaks to how decisions made about where to work can be driven by emotional factors – feeling 'under a cloud' in the private practice under new management, contrasted with being supported and valued in the predominantly NHS setting – despite wanting to earn more.

One participant working in private dentistry spoke about the changes announced to the contract in July 2022, and how they are not sufficient to draw them back to the NHS now they no longer hold an NHS contract:

> *"I mean if this, if these changes has happened three years ago, before we dropped our NHS contract, we would still have it. They've dropped it, um, and yeah. I'm never closing the door on going back to the NHS. It's, it's, it's been part of me for a long time. I'm sceptical that the changes are going to give the time needed to do a good job still."*
> *Emma, dental therapist, private provider, 20 years experience*

This will be discussed more in the sub-theme 'a crisis of hope'. Other participants cited that the UDA system is a significant barrier to recruiting and retaining dental professionals in the NHS:

> *"Would I want to work as – I suppose it goes back to – if I was to qualify now as a dentist, would I want to work in NHS practice? No… and I went into*

dentistry because I wanted to help people but you just think, 'Would I want to do an N-, - would I want to have my role restricted in the way that it is... working in an NHS practice, knowing that I couldn't do the best for the patient because it's just not funded and I would end up actually losing money?' Erm... I don't – I wouldn't, I wouldn't want to do that… I wouldn't want to work as – within a UDA contract as it is at the moment. I'd find it, I'd find it soul-destroying."

Mark, oral surgeon, private provider, 35 years experience

One participant felt like dental professionals are using the contract as an excuse to leave NHS dentistry, but their real motives are the salaries which can be earnt in private practise:

"I think there's also people who are using the contract as, like, 'I want to leave now', and that's fine, and earn a bit more money."

Serena, foundation year dentist, mixed provider, 1 year experience

This implies that unless the NHS dental care sector could meet the salary expectations of the private sector, some members of the profession would be unwilling to provide NHS care. Others speculated that the only way to get a sustainable workforce in NHS dentistry is to recruit those just starting their careers into the NHS:

"the reform of the contract incentives more dentists to do NHS work, it's not gonna get people who currently do private work to come back to the NHS. I don't think that once people make that decision to go mostly private they realistically are gonna come back in any meaningful capacity to work in the NHS. I think it's new people."

Ryan, foundation year dentist, NHS provider, 1 year experience

"I worry about is that there will be no NHS dentistry because if they don't do something sooner rather than later, literally there is not going to be anybody left. And nothing that they're going to be able to do because of the money that's available is ever going to be attractive enough to get people back again. You know, even if they go to a core service, I mean, maybe the younger dentists will do it."

Lisa, dentist, mixed provider, 27 years experience

The implication from both Ryan and Lisa is that once a dental professional experiences working conditions within the private sector, they are cemented. This was also raised by Emma: there is a difference between retaining people with NHS contracts, and drawing those back from private provision, with the former presented as possible and the other unlikely. Whilst the data presented here from Anya provides evidence that dental professionals who provide only private care can, and do, switch to NHS provision, it also highlights the balance between the push and pull factors and how the dental practice itself can amplify these.

Sub-theme: An intentionally unworkable NHS contract?

Whilst the previous themes have addressed the idea of choosing where to provide dental care – i.e. that both NHS and private dentistry are a viable option – this theme addresses the conspiracy that NHS dentistry is intentionally being made unworkable. This data presents the idea that deciding where to provide care is not the result of free choice but as part of a plan to limit the provision – and cost – of NHS dental services by the government, and ultimately underpins the push factors from the NHS:

> *"sometimes I'm thinking, 'Are they doing it on purpose? So they push everyone to just go private and that's it. Deal with it.' This is what's obvious."*
> *Sara, dentist, mixed provider, 13 years experience*

Some continued to speculate why this is advantageous from a political point of view:

> *"Personally, I think the government… I think they're trying to get rid of NHS dentistry, but they're trying to get the dentists to be the ones who put the nail in the coffin so that they can turn round and say, "Well, we were willing to fund NHS dentists, but nobody was willing to be an NHS dentist," you know."*
> *Lisa, dentist, mixed provider, 27 years experience*

Lisa proposes the theory that the government is waiting for a critical mass of dentists to hand back their contracts for NHS dentistry, so the collapse of the system can be attributed to the profession as opposed to politicians. Another participant speaks about the proposed changes, and piloting, as a method to acknowledge the distress of the profession with no real intention to change:

> *"I've always been sceptical about the desire to change the contract. You know, there've been these pilots, and whatnot, which I just – I think are paying lip service to the – to the – sort of acknowledgement from the – the great and the*

good that – that things need to change."

Daniel, dentist, private provider, 7 years of experience

Another participant reflects on this, identifying that as long as there are people continuing to make NHS dentistry work there is little incentive for the government to change the contract:

> *"I think it's poorly remunerated, very poorly remunerated. But if you hit the targets and you make the money I suppose we're just going to be providing to the government that it's possible. But it's what kind of service are you giving people, that's the question."*
>
> *Anya, dentist, NHS provider, 30 years experience*

Others approach the lack of change as a strategic choice not to eradicate NHS dentistry but to significantly change the remit to a limited 'core' service:

> *"I sound cynical, but I think it's, erm, it's the Government or whoever is in charge of funding and the policies and the contracts and whatnot is just, it's been underfunded. It's just been picked at and picked at on purpose. You know, they're doing it strategically, it's strategic… [I think] it'll end up being maybe like a core service, you know, an A&E type NHS dentistry whenever, you know, in the next few years."*
>
> *Krish, dentist, NHS provider, 12 years experience*

Continuing with the idea of funding, or, specifically funding which appears to be unused, another participant talks of practices in their locality which have handed back their NHS contract:

> *"I think it is – it, it is the result of a failing system because dentists have adapted to that system but erm, perhaps it is the intention erm, that it's been a, a – by stealth – er, introduced erm, and certainly, we, we see – you know, locally, we've seen practices that have kind of – erm, we've seen two NHS practices that have closed down and we don't know where the funding has gone for that."*
>
> *Paul, dentist, mixed provider, 15 years experience*

Again, to the profession the money which is being unspent due to practices no longer providing NHS dental care, or which is taken back through the government through clawback, appear to be absorbed by entities which are not NHS dentistry, which

reinforces the vicious cycle of practices choosing to hand back their NHS contracts due to lack of funding. The idea of 'stealth' underfunding is interesting as it implies a lack of transparency about the situation and underhandedness from the government. This is reflected by other participants who discuss that the public perception and media narrative enables the blame to be shifted onto the profession:

> *"You have to do private work as an NHS dentist just to afford to be able to do NHS dentistry. NHS dentistry, you run at a loss. Absolutely run at a loss. So, you are inherently…. No one will ever believe you, because everyone, the public always think money-grabbing dentists, but NHS dentistry is a, is a, you know, is a money loser. It's, it's not, "Oh my God, I can go on my ten holidays this year." It's, "Can I afford to pay the mortgage?" You know, it's that sort of thing."*
>
> *Lisa, dentist, mixed provider, 27 years experience*

4.4.2 Theme: Catalysts

Whilst the current dental contract has been widely and publicly discredited since its implementation in 2006, it is only in recent years that the perception of NHS dentistry has shifted from being able to meet demand, to not having enough appointments to satisfy the population (BBC, 2022; King and Charlwood, 2022; Steele, 2009). Whilst available data makes it difficult to identify the actual amount of labour lost from NHS dentistry, and the trend over time, it is evidenced in reports about the availability of NHS dental appointments across the country and is reflected by the practice manager, Kimberly:

> *"over the last two years we've lost – we lost all but one of our dentists, every single one of them left. And other than the one that went for a more senior role, every single one of them went to a private practice and they left the NHS."*
>
> *Kimberly, dental practice manager, mixed provider, 5 years experience*

This section identifies the catalysts which have changed the NHS dental contract from manageable to unsustainable from the perspective of the dental professional. Naturally the issue is multifaceted, with some catalysts originating outside of the dentistry sphere, i.e. exogenous shocks including global and national events, whilst endogenous relate more specifically to the dental care sector.

Sub-theme: Exogenous shocks

The exogenous shocks identified in this sub-theme include COVID-19, Brexit and the cost-of-living crisis. The mechanisms by which they impact labour supply are multifaceted, and will be addressed in turn in the following sections.

The impact of the COVID-19 pandemic on dentistry

Given data collection started in July 2022, an obvious starting point for the discussion of catalysing factors is the COVID-19 pandemic. Chapter 2 documented the changes which occurred regarding the delivery of dental care as a response to the pandemic, and 45% of the workforce are reported to have decreased their NHS commitment since the start of the pandemic (King and Charlwood, 2022). This sub-theme will explore the wider impact it had on the dental profession.

Participants noticed that patients who resumed dental care often presented with more than one issue, which given the backdrop of the issues outlined with the dental contract surrounding time and return in terms of UDAs, tipped the viability of the dental contract from manageable to unsustainable:

> *"I'm seeing patients now still that I haven't seen since 2019 and they don't come back with one problem. They come back with multiple problems and I felt like before Covid, you kind of – you were on this like knife edge erm, where you'd just – if you had a stable base – patient base, it was okay. You could just manage to, to kind of get by and make it work… and then Covid came along and it just… you know, I was having to do multiple – I was getting people back for three appointments to, to do the things that they needed to for that one course of treatment"*
>
> *Paul, dentist, mixed provider, 15 years experience*

Another participant reflected that people were able to prioritise their oral health as a consequence of the pandemic, resulting in more demand:

> *"I do think although the pandemic's been awful, it's also been a reset in lots of people's life. They've changed things. They're working differently. They might be working from home, so they've got a bit more time to come. Um, they've been wearing a mask a lot and that means you can smell your own breath, which I'm sure has had a, an impact on people wanting to seek care... Also, dentistry's been in the news a lot because people can't find a dentist and when things are in the news then and you know there's a shortage of*

something, then you tend to seek it out. So although they can't find an NHS dentist, they are finding a dentist"
Emma, dental therapist, private provider, 20 years experience

Interestingly they also note the impact of the media in the demand for dental care. Whilst the above has documented the strain the pandemic created in terms of additional demand for oral healthcare and increased treatment needs, others saw a trend in terms of increased willingness to pay for private care:

"we had more time to contemplate on where things were heading and what we saw in the, in the space, was that actually, there was a demand for private, and people were prepared to pay for private and quite a lot for private as well. And what we started to see was that NHS dentistry became something that was really in demand and, obviously, when dentists are in demand, like any commodity… the price goes up. So, so dentists were finding, we were finding in our group that we could charge a lot more for private dentistry and people were pre, prepared to pay it because they were, they needed it"
Chris, practice owner and dentist, mixed provider, 22 years experience

The quote from Chris implies that increasing private care was now sustainable as a result of increased demand. However, this approach of capitalising on the demand for dental services by increasing private provision was thought to be problematic by other participants:

"I feel like there are a lot of people who, whether they've wanted to or not, have been forced to seek private care for pain relief, and have then, you know, gone back to the NHS for ongoing care. Which, I – I think definitely – is definitely – you know, definitely contributing to the – to the – to the antipathy that a large body of people seem to be holding towards NHS dentists… On that point, I don't think a lot of good was done, inadvertently, where there was the issue of, 'Oh, well, we can't see you, by law, on the NHS, but if you wanna pay £200, we can see you privately.' That, again … problematic. Very problematic. Because, to me, that – that was holding people to ransom."
Daniel, dentist, private provider, 7 years of experience

Daniel presents this behaviour as profiteering and emblematic of price gouging, and ultimately reflecting poorly on the profession as a whole instead of individual practices engaging with this behaviour.

The impact of COVID was discussed as two-fold. The above has evidenced how the demand for appointments, and the volume of treatment required, was impacted by the pandemic. These are both related to the patient base – i.e. there was a bottleneck of patients requesting appointments, and more treatment was often needed by those who saw a dentist. The other impact however was on the profession itself, as people took the opportunity to consider their careers, and their future, with some choosing to reduce or remove their labour to the NHS:

> *"[Because of COVID] a lot of my colleagues looked at – around and thought, 'Hang on, I'm over 55. If I get Covid, I could be really ill. I'm higher risk. My pension's done [yeah]. I think I'm out.'."*
> *Mark, oral surgeon, private provider, 35 years experience*

> *"I have been an NHS dentist for the 27 years I've been qualified, and, er, it's, it's soul-destroying, working as an NHS dentist. Because it's just you can't do what is expected of us and what our patients expect of us and what we want to do for our patients, with the way that the contract is, er, being delivered, or not as the case may be. And I hung on and I hung on. And I think everyone, everywhere, pre-COVID, everyone knew it was bad. But I think we always… we were, we were in talks. And it was always… I mean, even though it had been 14 years' worth of talks, it was always, "It will change. It'll change," and it never did. And then I think COVID and the lockdown and what's happened since then is just, has just concentrated everyone's mind on the fact that nothing's gonna change."*
> *Lisa, dentist, mixed provider, 27 years experience*

Lisa specifically talks about how during the pandemic, focus shifted from holding out for change to the contract to despondency. This is explored further in the theme 'a crisis of hope'. Another reflected on how they felt the responsibility – and fault – of being behind on UDAs was being placed on the profession despite of members of staff being ill due to COVID, and ultimately this stress and pressure was unsustainable:

> *"What happened with Covid? People called sick. I have – I remember, in some point, the practice – everyone is calling sick. Like the nurses are sick. Dentists are sick. How do you want me to, to hit that target if I have – my nurse, she's five days off. Another nurse is five days off and they couldn't replace me with a*

nurse. So now, you know what, what I had to do? I had to do – once she's back, I had to do extra hours and then open Saturdays. This is the thing and then you end up, again, stressing yourself."

Sara, dentist, mixed provider, 13 years experience

Brexit

Whilst the previous sub-theme identifies that COVID provided an opportunity for dental professionals to reflect, often resulting in the withdrawal or decrease of labour to the NHS, a different but direct path to the reduction of labour available to the NHS was the impact of Brexit:

"Erm, within our local – I mean it's something that's not talked about – with our local hospital service in (a city), they lost 12% of their staff after Brexit because they've all left [okay] and those haven't been replaced because there's nobody to replace them."

Mark, oral surgeon, private provider, 35 years experience

Where practices have tried to recruit from abroad to help supplement their workforce, the hurdles in terms of getting appropriate visas for the Right to Work in the UK has created an additional burden for practices:

"We, for the first time last year, we became a, a sponsor for a visa for overseas applications. I mean who would have thought that? You know, I'm a dentist. I know about teeth and suddenly, I had to, to read and learn how to get a, a visa for someone like that… I became a company's immigration officer"

Chris, practice owner and dentist, mixed provider, 22 years experience

Cost of living crisis

Some reflect on the upheaval in NHS dentistry as a result of rising costs, meaning that UDA rates are increasingly unable to cover the fixed costs of running practices:

"everyone knows the cost of living is going up massively. Our costs as clinicians are going up massively. As a practice owner, your costs are going up horrendously with, you know, everything. But if you're getting paid the same, we have no option to change the fees. The fees, what we earn as NHS dentists, are set… The patients don't understand that. But, you know, so if the costs are going up massively, our indemnity is going up, just the general costs

of materials, etc., etc. Overheads, utilities. Something's got to give somewhere."

Krish, dentist, NHS provider, 12 years experience

The quote from Krish highlights that, from the practitioner point of view, their UDA rate remains the same whilst their costs are increasing. Chris picks up this point as a practice owner, noting that within NHS dentistry it is impossible to increase charges to cover increasing costs:

"if there's inflation, then we can say, 'Right. We're going to increase our private charges by 10% because our electricity is more, the materials are more', but on the NHS, you can't do that. So, so I can imagine there are practices where they're probably, they're probably at a point where it's not actually viable to continue like that. And that's why practices close, or they give their NHS contracts back, and that's something that's become even more commonplace with dentists' practices and giving their contracts, er, back. "

Chris, practice owner and dentist, mixed provider, 22 years experience

Sub-theme: Endogenous challenges

The endogenous challenges identified in this sub-theme include 'the professional pipeline' and 'a crisis of hope'. The former considers the opportunities available to dental professionals, and how they have developed into 'leaks' in the supply of labour to the NHS, whilst the latter reflects on emotional state of the dental professionals.

The professional pipeline

This section gets its title from a metaphor used by one of the participants, Simon:

"If you look at it like a pipeline, we are shoving new dentists in at the start and you are going to lose some along the way to the private sector, to I don't know, err changes in career or ill health, erm what you've got to try and do is close some of the holes and shift the holes as far along into the future as possible so you know, ten, 15 years ago the people that were coming out the pipe, the NHS pipeline, would have been later on in their career, either retiring early or going into the private sector. Now, that pipeline is absolutely riddled with holes from the start so they're barely coming out of dental foundation training"

Simon, dentist, private provider, 35 years experience

The pipeline from dental training into sustained NHS dental care, as identified, is failing to deliver sufficient labour to sustain NHS dentistry. Against the backdrop of the push and pull there are multiple reasons evidenced which will impact graduates' decisions to supply (or not) full-time NHS dental care, this section focuses on why this issue is becoming particularly widespread now. Starting with the data from the foundation year dentists interviewed, Ryan and Serena:

> *"I don't plan on clinical dentistry being my full-time job, probably ever. So like being – doing an associate role for a couple of days a week as opposed to doing an associate role full time, I think it's like a big sort of step change in work and stress and repetition."*
> *Ryan, foundation year dentist, NHS provider, 1 year experience*

> *"our generation of dentists is more work/life balance and that's really important. We should be able to have that. And we can't have that, if we have to work flat out and then are stressed when we come home about numbers and litigation and everything, it's like nothing really works for us."*
> *Serena, foundation year dentist, mixed provider, 1 year experience*

Both of these participants state that stress is a concern for them in relation to an NHS career, with Serena identifying that the 'pull' to NHS dentistry is not enough to feel like the system works in favour of the dental professional. Other participants reflect on graduates' reluctance to join the NHS workforce, highlighting that the work environment offered by the private sector is often the rational choice:

> *"if you have the opportunity not to get involved in a shambles, why would you want to get involved in a shambles"*
> *Krish, dentist, NHS provider, 12 years experience*

> *"Just speaking with my colleagues who graduated in the same year, erm, all… Probably most of them are going into purely private practice and hardly any doing NHS general practice anymore… Like, the work that you do under the NHS, the same work that you would do privately, like putting in exactly the same effort, using the same materials, you would earn so much more. So, unless people are in those areas where perhaps jobs are more, like private jobs are more scarce, then I don't see many of the people I know going for NHS dentistry."*
> *Grace, dentist, mixed provider, 3 years experience*

Another factor when discussing the choice graduates make when entering the labour market is how expectations have shifted across generations:

> *"All of us that qualified 20 years ago, like me, expected to work in the NHS. That's, we expected to… all us therapists, we expected to come out and work in the NHS and as the dentists, all the dentists that I qualified with then all came out and at least worked in the NHS for a, a time. They qualify now and they don't even want to [start]."*
> *Emma, dental therapist, private provider, 20 years experience*

> *" [When I qualified I was working] 9-5, five days a week and then I was working one evening a week in practice and a Saturday morning in practice and erm there was just a different approached towards life/work balance… Also, if you're not comfortable with having your income drop by the same amount because you're working less, you actually think well actually I can work four days within the private sector and earn the same as I was working five within the NHS… 20 years ago there wouldn't have been the jobs for you to do private dentistry"*
> *Simon, dentist, private provider, 35 years experience*

Related to the later point by Simon, Mina noted that when they graduated there were only two options for clinical jobs:

> *"when I did qualify, there was no such thing as private dentistry. You basically, when you qualified, there were two options. One was hospital dentistry. The other was general practice. And general practice always meant NHS."*
> *Mina, practice owner and dentist, private provider, 32 years experience*

The quotes from Simon and Mina imply that previously, the pipeline from graduation had little opportunity for haemorrhaging, i.e. to leave NHS dentistry would be to leave dentistry, they were not faced with the same choice as recent graduates. The growth of the private sector, and the increased willingness to pay for dental care, now means that private dentistry is a sustainable option for more providers.

Another consideration in terms of the dental market is the desires of the profession, with some noting that cosmetic and aesthetic work is increasingly of interest to younger generations:

"We have a lot of young dentists in our [practice], like, they're in year one, and they're already wanting to do private. You know, they see themselves as Instagram, Instagrammers. Um, they want to do cosmetic stuff. They don't want to be doing UDAs and doing fillings for three new UDAs. This is not of interest to them. They want to go on courses. They want to do cosmetic stuff. They want to be using the best materials. They want to earn the highest salaries. They're not interested in doing this sort of, like, publicly funded, er, dentistry and that's, and that's after one year."
Chris, practice owner and dentist, mixed provider, 22 years experience

The role of social media is identified as an influencing factor for younger generations, where people are being shown a lifestyle only sustainable in private care:

"Instagram has become this like real glamourous dental thing and like everyone's on Instagram and it's all about like lovely cosmetic work that you do and these like beautiful composite bonding cases and whitening. And they've all got their own logos and they all work at these fancy practices that look like hotels. There's no attraction now to work in the NHS because the sort of idea of it is like the sort of stigmatised thing of like, oh God you're seeing these horrible people and you're doing horrible work. Whereas you could be earning – I mean the idea is that you're earning loads more money, I don't know that you necessarily are but, er, it's been glamorised a lot I think."
Kimberly, dental practice manager, mixed provider, 5 years experience

Some suggest that there is a selection bias happening before dental professionals graduate, that people are now entering the dental profession with the intention to only work in the private sector:

"it's not just the fact that they, they don't want to do NHS dentistry because they don't like NHS dentistry. I think they actually – the, the reason they did dentistry in the first place was so that they could work in private care. I don't think there was ever any intention to do NHS dentistry which, again, is – that's an issue that we need to look at erm, from the admissions point but that's very difficult. It's very, very difficult to, to do that."
Mark, oral surgeon, private provider, 35 years experience

This means that although the intake may be the same – or larger – than previous years, the potential labour available from a graduating year will be significantly

different to 20 years ago and to extend the previous metaphor, the pipeline has a faulty intake.

A crisis of hope

Building on the shifting landscape of dentistry over the past two decades, a notable undertone was the lack of hope for the future of NHS dentistry, which manifests in a sense of exhaustion with the promised reforms, which have never come to fruition, and decisions taken by participants to start investing their labour in the private sector to provide stability:

> *"I think that fourth day now probably will be in private practice. Just because I'm well aware of the issues surrounding NHS dentistry. I'm really not sure how long it will be a viable career option. I don't want to commit any more time to it. Erm, and I'd happily go into private practice with the same ethos that I have now. So as long as the, the owner knows that I'm not really going to do a lot of cosmetic treatments and that kind of thing, if they're happy with that, that I'm just a, you know, a good general dentist, er, then I'd be happy with that."*
> *Krish, dentist, NHS provider, 12 years experience*

> *"I was considering private care because, erm, I wanted to continue upskilling. I can use an intraoral scanner, I can do cosmetic work, because of the opportunities in the more higher end practice that I'm working in now, and I thought I might have the opportunity within this kind of, they call it a mixed practice, but it is pretty much just NHS, erm, and I don't have that option. So, I'm actually looking for an additional private role. In my heart of hearts, I still feel like I have a duty to do some NHS work, erm, but I don't know if it's sustainable. I really think I would burn out if I was there, long term. I'm only doing one day a week as well."*
> *Grace, dentist, mixed provider, 3 years experience*

Interestingly, both of these participants talk about a lack of sustainability as someone working in the NHS but they emphasise different pull factors which are important to them moving forward: Krish reflects on the importance of continuing their ethos, whilst Grace highlights the importance of professional development. This contrast highlights that although the outcome can be the same, the motivations of each dental professional can be different. Other participants talk about the physical and mental toll experienced working under the contract, expressing symptoms of burnout:

"you know erm, yeah, the ideal would be [laughter] sometimes a different job, although I'd totally miss my patients erm... but, you know, private dentistry is probably looking like it's – it – it's on the cards because I can't do what I've done over the last nine years er, physically. Physically, I couldn't do it erm, and mentally, I couldn't do it and, and, and there's no way I'd want to put myself through it again."

Paul, dentist, mixed provider, 15 years experience

"I'd reached, quite frankly, saturation point with NHS, and the incessant target chasing, and the – the constant treadmill of trying to quantify what needs to be done, and doing the right thing for people, and not necessarily being paid for your time, and … I think it – as much as anything, it was sort of a fatigue of, 'I'm doing all this work for people, I'm doing the right thing, I can sleep at night, but the – the pay isn't reflected in that.' And it was – I was at the point where the hours I was working, the money coming in at the – the end of the week, the end of the month, didn't – didn't measure up with the amount of effort and hours going in, and I thought, 'I need to change the way that I'm working.'"

Daniel, dentist, private provider, 7 years of experience

Again, it is highlighted that it is not that they feel overworked and therefore require a break, but the sense that working in the NHS will always be like that, which has compelled these participants to either leave or consider alternative options. Another participant talks about the fatigue that comes from working within a system which seems to work against them, and deciding to prioritise their own well-being:

"So now you are losing people because mentally, we're all stressed. To be honest, we're all tired. It's like fighting, fighting, fighting, fighting. Of course, you're going to say – as I said, you have to start – now a lot of dentist, they're starting – 'I have to put myself first. Is it good for me? Why I'm doing this?' Yes, of course, there are people and we do care about people. As I said, you need to think about yourself as well."

Sara, dentist, mixed provider, 13 years experience

Another factor contributing to the lack of hope for the future of NHS dentistry is the length of the contract reform process. Krish and Paul reflect that over the course of their career, the landscape for dentistry has gradually gotten worse:

“in the 10, 12 years, there's not been any positive improvements, at least in NHS dentistry, I can't really comment on private dentistry because I don't have the experience. But from my friends, because I have a lot of dental friends, from my friends, nobody has really got anything good to say about dentistry in terms of from when we started to where we are now. Nobody is happier, if that makes sense.”
Krish, dentist, NHS provider, 12 years experience

“over the years is because erm, you know, it was always this swings and roundabouts – [a former Chief Dental Officer said], ‘It’s swings and roundabouts. Some things you get paid for and sometimes you don’t get paid for.’ But as, as time went on, you know, they, they seemed to kind of tweak a lot and measure us so much that they really, really could hone down and say, ‘Actually, those swings are out and so you’re just left with the roundabouts.’”
Paul, dentist, mixed provider, 15 years experience

In relation to the tweaks announced in July 2022, Paul goes on to say:

“so what do I think of the erm, proposals, the tweaks? Erm... they might help a little bit but it’s too little, too late.”
Paul, dentist, mixed provider, 15 years experience

This statement, ‘too little, too late’ is a succinct way of expressing two unsatisfactory factors of dental contract reform: the changes that have been made, and the time it has taken to make them. The implication being that given the time that has passed, the changes need to be significant, i.e. more than the tweaks announced in July 2022, as the goodwill and patience of the profession have been eroded. Similarly, others state that the changes are not enough for those who have already withdrawn their labour from NHS GDP, or are considering leaving:

“I think people are literally saying its just a sticking plaster, it’s not actually gonna help anyone who was thinking about leaving to stay, fine if you were gonna work in the NHS anyway, it might help you a bit, but yeah, I think the feeling was definitely that it’s not enough of a change and I would say that’s true.”
Helen, dentist, community dental service (NHS), 5 years experience

"I think they're just trying to appease people actually… I don't know that the thing's enough, all I've read is the comment about it and the sort of – I know that the BDA for example… they're not pleased with that. So they're saying, oh you know this isn't good enough. We're going to go back and complain and blah de blah. So I'm not really au fait, I should be because the piece of paper was there, because largely I feel a bit exhausted by it."
Anya, dentist, NHS provider, 30 years experience

Others reflect on this from the perspective of a practice owner, noting that promises cannot pay the costs associated with running a practice, whilst the private sector offers more stability in terms of what is under their control and how they can adapt to ensure a sustainable business:

"we've had a few false dawns, we've had a lot of promises and as a business owner I can't survive on false promises, you know, I can't… if we were sitting down having a, you know, a 12 month or a three year or a five year vision for the practice and we've got staff saying well you know we want to have an increase in our income, we want to have err better job opportunities, we want to do this, this and this, the only levers I've got to pull are in the private sector so I'm going to invest the future of my practice out with the NHS"
Simon, dentist, private provider, 35 years experience

"various governments have made noise about changing it and it hasn't really been done. And I think that's one of the things that's caused unhappiness about it because during the pandemic, we were, sort of said that we were, in a way, promised that things would change and that something was forthcoming. And here we are, 10th of July '22, and nobody knows any different… I think if people thought that by the end of the financial year, if we knew that, say, 1st of April 2023, we're going to have a brand new dental contract, which is going to deal with a lot of issues that we're facing, people would probably be quite happy to stick with it and work in the current UDA format thinking, 'Well. Next year, it'll be different', but what we've seen is every year it's the same and people just think, 'You know what? Actually fed up with it now, and I, I don't actually even want to know about it'."
Chris, practice owner and dentist, mixed provider, 22 years experience

This lack of hope and frustration is thought to be contagious, with the low morale transferring from those working in NHS to prospective graduates and ultimately eroding their commitment to the NHS before they have started practicing:

> *"there's a lot of young dentists who are just totally – and I think that pa-, - it's passed on from a lot of dentists who've been working in the NHS, you know, and they, they speak to the, the younger ones and, and there isn't – I don't think there's many young dentists I've spoken to who have any hope really for it long term."*
> *Paul, dentist, mixed provider, 15 years experience*

> *"I think there is less of a connection or a commitment or a loyalty to the NHS perhaps for the generations coming through now. They haven't seen the good times, they've only had the bad times and I think someone my age, if I reflect on the generation above me, for what they did for the welfare state, for social services, for health service, for education, the investment that they put in and what they built, I've had advantage of and I'm not sure what I'm leaving behind is a great deal better, we have done very well out of it."*
> *Simon, dentist, private provider, 35 years experience*

This is highlighted by Simon, who speaks of the commitment – or hope – which can come with experiencing something at its peak and waiting out the 'bad times' for it to return to its former prime.

4.5 Discussion

This chapter has explored themes regarding what draws dental professionals toward, and repels them away from, the NHS and private dental sectors outlining a complex network of push and pull factors. This chapter also examines why the balance of these factors currently is currently attracting more of the profession toward private care in the catalysts theme.

The sub-theme 'Pull towards the provision of NHS dental care' evidenced that people are drawn toward NHS dentistry for reasons surrounding the ideological stance, the total compensation package, and the experience which can be gained from working in an NHS GDP setting. These reflect common reasons for providing NHS dental services which have been identified previously (Lynch and Calnan, 2003). The 'Push away from the provision of NHS dental care' sub-theme outlines several reasons why the public oral healthcare sector is unappealing to oral health professionals: the

perceived disconnect between those making decisions, and those enacting them, the monitoring and bureaucracy associated with holding an NHS dental contract, and finally the contract itself which leads to a pressurised working environment which detracts from patient centred care. The latter being cited as a key challenge working in the NHS dental sector (Collin *et al.*, 2019; Evans *et al.*, 2023). The 'Pull towards the provision of private dentistry' sub-theme cites that being able to offer patient centred care, the income associated with private dentistry, and skill development are all draws toward the private sector which reflects existing literature (Evans *et al.*, 2023; Lynch and Calnan, 2003). However, it also notes that as a consequence of private dentistry now receiving previously NHS patients the landscape of private dentistry may be changing, with dental practitioners being increasingly limited by the budgets of patients.

What it is not possible to determine from the push and pull factors explored in this analysis is the relative strength of each consideration. Previous work which has examined the strength of push factors from NHS healthcare services found the largest to be stress related to workload with the lowest recognition of contribution (Weyman *et al.*, 2023). The sample did not include the dental workforce, and knowing if this is the most salient issue would be a useful insight into what must be addressed in order to recruit and retain more dental professionals into the NHS.

The sub-theme 'Private care: an absorbing state?' explores if those who start providing private care will continue or increase their private dental care provision relative to their NHS commitment. The data presented establishes that this is not the case, and presents a deviant case where Anya went from full-time private care to an NHS practice. However, the stated justification for this was not presented explicitly as a push or a pull factor, but instead was a reflection on the working environment of the practice itself and the moral integrity of the practitioner. This is discussed in a later paragraph.

Considering why provision of dental services is currently shifting, the theme 'Catalysts' presents five factors which have changed in recent years which are presented as amplifying the outlined push and pull factors. These are split into two sub-themes: exogenous shocks, covering national and geopolitical issues, and endogenous challenges, which focuses more on NHS dentistry in England. The exogenous shocks sub-theme covered issues including COVID, Brexit, and the cost of living crisis. Whilst all three of these events are unprecedented, the evidence

presented here indicates they have all affected NHS dentistry in different ways: COVID has increased demand for services, whilst Brexit has reduced the workforce, and the cost of living crisis has impacted the running costs of dental practices. The endogenous challenges sub-theme presented two issues: the professional pipeline, and a crisis of hope. Whilst the former explores the 'leaky' pipeline of undergraduate dental qualifications to retirement, noting that not only have the opportunities to leave the NHS sector have increased over time, but people entering their qualifications may have no intention to work within the NHS, the latter addresses the prolonged dental contract reform process and the toll that has taken on the profession.

According to the academic literature, stress and burnout within the dental profession in the UK is not a new phenomenon, with some identifying that those who spend more time working in an NHS setting showing higher levels of burnout (Denton, Newton and Bower, 2008; Myers and Myers, 2004). Whilst these studies refer to dentistry before the introduction of the 2006 dental contract, more recent data indicates that just under 55% of the workforce are experiencing high levels of stress, with the threat of litigation, NHS targets, and NHS work identified as 'top 10' stressors, whilst data from Wales indicates that the pandemic has been an amplifying factor to stress (Collin *et al.*, 2019; Owen *et al.*, 2022). These metrics highlight that working in a GDP setting is stressful, and where work has been carried out according to sector, or focus on the sources of stress, the findings indicate that NHS work is a key contributor to stress and therefore support the evidence presented here that dental professionals may choose to engage with more private work because of the stress they experience in a NHS GDP setting as a result of the UDA structure outlined in the 2006 dental contract.

It is important to note that although the NHS dental contract is cited as a source of stress for the workforce this may not be a significant push factor for all dental professionals as the pressure associated with that may be mitigated by the working culture of the individual practice. Krish states that they are aware of the targets the practice must be facing in relation to their dental contract but they do not experience their practice putting them under pressure to meet targets. This highlights the importance of the environment of the individual practice itself, and how that can compound stressful situations into dental professionals feeling under pressure to meet targets or potentially alleviate pressure by allowing them to self-govern, i.e. the working in a dental practice under the 2006 contract can, but does not necessarily,

lead to heightened stress. The importance of the individual practice is also highlighted by the deviant case where Anya recounted leaving private dental care as they were uncomfortable with the business plan of the new owners, and Daniel who states it is their individual practice they cannot imagine leaving at this point in time.

As mentioned previously another one of the main stressors identified by Collin *et al.,* (2019) was the threat of litigation. This was also reflected in the NHS survey on Working Patterns, Motivation and Morale (NHS Digital, 2020). Whilst this is briefly mentioned in the preceding evidence, it is not fully developed as a theme here as the data indicated this is something that was prevalent regardless of the sector of work, i.e. it is a stressor of working as a dental professional, but not a push or a pull to either sector. It does, however, point to the shifting landscape of dentistry. This was discussed in the professional pipeline sub-theme. As noted by some of the participants in the professional pipeline theme in the last 30 years dentistry as a sector has shifted from exclusively NHS to a mix of private and public, with the private care sector growing in recent years. This means that until recently the dental care market has not been able to sustain providers offering exclusively, or predominantly, private dental care (Lynch and Calnan, 2003).

In order to shift provision from NHS dental care to private dental services there must be sufficient demand in order to do so. Whilst some of this will be related to the nature of services offered, with some members of the population desiring more cosmetic and aesthetic treatments which are only available in the private dental care sector, the data presented attributes a large shift in the market from public to private as a result of COVID, as demand increased in the private sector, and supply shifted to meet that demand, i.e. the shift is demand-induced. However, dentistry as a healthcare service also inhabits a space where a lot of oral healthcare services are a need, and if there is a shortage in services which are thought of as essential in the public sector, demand will shift to meet supply in the private sector at a higher price point.

There is a risk therefore that the cycle is self-perpetuating: if a limited labour market shifts to meet the demand in private care, there will be less labour available in NHS care, meaning less appointments, and more people will seek private dentistry. This spiral is similar to the adverse selection of the insurance death spiral, however it will instead leave the people who are on low incomes and exempt from paying – i.e. those who typically have higher needs – dependent on NHS dentistry, with a limited

workforce. As evidenced in the ‘Push’ sub-theme, under the 2006 contract arrangements, practices are currently reluctant to accept new, high needs patients due to the time it takes to treat their needs, and the reimbursement they will receive for it. This has problematic implications for oral health inequalities, where those who cannot afford private care are dependent on the NHS but have no recourse in which to access it. This is already an issue in certain parts of the country, where dental professionals have dropped all of their NHS commitments leaving members of the population with no local access to NHS dental care (Evans *et al.*, 2023). In less extreme cases, this could lead to the rise of a pseudo-core service, where private dentistry is to become the default, and NHS dentistry left for vulnerable and marginalised groups with high needs. Whilst this may not be an unacceptable course of action – to reserve NHS resource allocation for those with the highest need and lowest ability to pay, which would in fact meet the ideological pull outlined – this is a direct contradiction to the current dental offer and has yet to be proposed to those who fund and use NHS dental services: the general public. Furthermore, previous research indicates that this is not reflective of perceived value in the public population (Carr *et al.*, 2021).

An interesting contrast in the data is the perception of young dentists, and the attitudes of the foundation year dentists presented in this data. Chris for example observes that young dentists often want to move into private practice after completing their foundation year, whilst Emma notes that dental therapists don’t want to even start their careers in NHS dentistry. The two foundation year dentists interviewed however, Serena and Ryan, speak about the ideals of NHS dentistry and their commitment to the ideology, specifically being able to help people and provide social value. The difference between the observations of Chris, Emma and others whilst the attitudes held by Serena and Ryan is somewhat striking. It is possible that the conditions of foundation year training – foundation year dentists are salaried, and therefore protected from the UDA system and the time-UDA trade off explored in this analysis – means that there is more focus on the patients, and the ideals of the NHS, than the practicalities of trying to make NHS work sustainable – although both note they do not plan full-time careers in NHS dentistry.

A strong thread linking the framework used for analysis is the idea of value within the workforce. Many of the quotes used in this analysis point to a workforce who feels undervalued by those making decisions, as if their presence, and the existence of

NHS dentistry is a forgone conclusion. This is not speaking to monetary value, but the intrinsic value of the workforce itself, i.e. the recognition of their time, expertise and skills as something which is needed and appreciated. This is something which has previously been identified as a factor which is important to the health and well-being of dentists (Gallagher, Colonio-Salazar and White, 2021). Both the sub-themes regarding a crisis of hope and disconnect between decision-makers and the profession evidence a workforce which feels they are overlooked. Whilst private care may not fit the ideological ideals of individuals working within dentistry, it does offer a platform where practitioners are delivering care patients want (and need) and are paid appropriately for their time and expertise.

There are several limitations with the study outlined in this chapter. Whilst the overall sample fulfils the purposive sampling criteria outlined, there are no recently graduated dentists who decided to go entirely, or predominantly, into private care. Given how the two foundation year dentists who were interviewed were ideologically committed to the NHS, having a recently qualified dental professional who had gone directly into private care would have offered a valuable perspective into why they chose not to go into the public sector, i.e. if the pull of the private sector was stronger, or if the push from NHS drove their decision. Instead, the perspective offered about young graduates who enter their undergraduate degrees with the intention of only providing private care, or with the intention to focus on cosmetic work, is offered through other participants speculation as opposed to something evidenced directly from this sub-section of dental professionals. From the data collected, there is often an idea perpetuated about dental professionals whose sole intention is profitability. However, money in the data is talked about in terms of sustainability from a business perspective. Either there is a dichotomy within the profession between the perceived ambitions of their peers, and the actual concerns of the profession, there is no-one within the sample who is motivated by income, or they are unwilling to disclose their interests in profitability.

With respect to the sample, there is always the risk that participants who opt-in to data collection (surveys or interviews) do so because they have particular opinions they want to share or issues they want to voice. Given that the sample was not randomly selected, and instead asked participants to register interest, there is a risk of selection bias. The diversity of the sample, and the richness of the data collected, suggests that this is not something to be concerned about. The sample can be

critiqued for a lack of representation in terms of dental therapists (where n=1) and dental nurses. Only one dental therapist was interviewed as their point of view was considered to be reflective of the thoughts and opinions expressed by the general sample, however it is worth acknowledging that additional dental therapists may not have shared the same point of view. Dental nurses were intentionally not recruited into the sample, although they are an important part of the dental team. Initially this piece of work was regarding the NHS dental contract, where dentists and dental therapists were considered the points of delivery for dental care. Given how the framework developed, it is now apparent that the perspective of dental nurses would be relevant and add more depth to the data. Due to time constraints in relation to the thesis, and the rapidly changing context of dental contract reform, it was not appropriate to go back into recruitment to add dental nurses to the sample. Similarly, additional sampling criteria, such as asking participants if they are full-time and how much time they spent in NHS and private care, could have improved the diversity of the sample.

The rapidly changing landscape of dental care in England also provided challenges in terms of data collection and the analysis of the data. As noted in the methods, during data collection there were changes announced to NHS dentistry which came into effect after data collection had commenced. The data was therefore able to capture an initial response from interviews conducted after the announcement, but with no insight into how this changed practice after they came into effect. Since then, a recovery plan for NHS dentistry has been announced for which there is no data available. Further reflections on this are available in the main discussion for this thesis.

With regards to the analysis itself, it could be criticised for not developing a theme regarding the push from private care. This is a reflection of the data itself: the data regarding pushes from dental care were thought to be insufficient to develop a theme surrounding the push from private care. Instead, the data regarding the push from private care is captured mostly under a deviant case.

4.6 Chapter summary

This chapter has provided an overview of push and pull factors to and from NHS dentistry, with evidence regarding why the balance has tipped in favour of the private sector in recent years. The evidence presented demonstrates that private dentistry is not necessarily an absorbing state: that some who switch predominantly into private

care do not consider the move permanent. However, even the more ideologically committed participants struggle to see a future where they are able to sustain themselves in entirely NHS GDP settings. What this chapter does not do, but is a worthwhile question for future research, is assess the relative strength of each factor. From the data presented it is apparent that some factors are more important to some participants than others, and gaining an insight into this at a broader level could be critical to understanding what the priorities for dental contract should be in terms of the workforce.

Chapter 5: Oral health and the oral healthcare system: the population perspective

5.1 Introduction

NHS dentistry has recently been described as ‘not fit for purpose’ and is currently struggling to meet the needs of the population it is intending to serve (Health and Social Care Committee, 2022; Health Social Care Committee, 2023). Two ways this can currently be observed is through persistent oral health inequalities, and the limited accessibility of NHS dental services (BBC, 2022; Public Health England, 2021). This implication is that the NHS dental service, as it currently exists, cannot meet its objectives of providing clinically necessary care to all who wish to use it. Whilst the previous chapter explores the workforce perspective and provides important context, this chapter addresses a broader issue of the oral healthcare system from the perspective of the public: what NHS dentistry should provide, to who, and consequently the role of the private care market.

As there is no consistent global standard regarding baseline oral health, or basic oral healthcare services, the role of a nationally funded oral healthcare system is unclear but has significant impacts for equity and inequalities (Locker, 2004). The World Health Organisation (WHO) has proposed thinking about Universal Healthcare systems – such as the NHS – along three straits: who is covered, which services are covered, and how the system is financed (World Health Organization, 2010). This is presented in Figure 5.1:

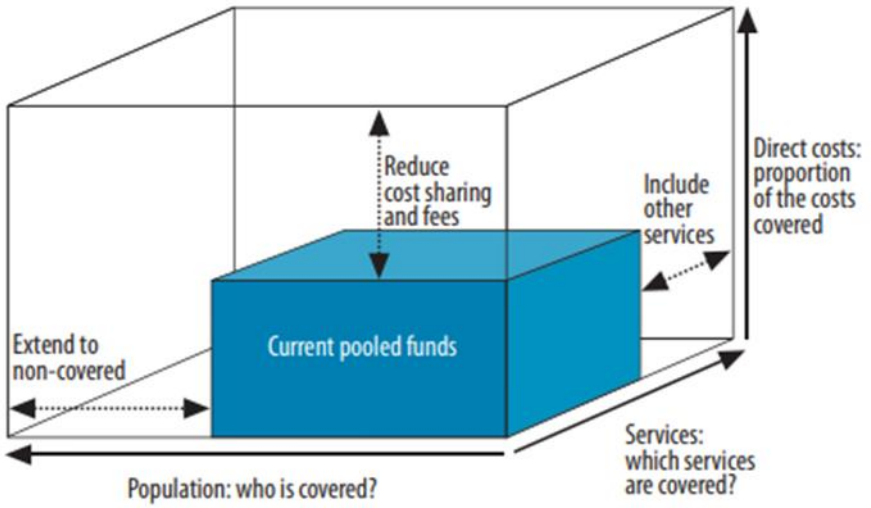

Figure 5.1: The World Health Organisation Universal Healthcare coverage cube

Since the NHS dental service is subsidised through tax levied on the general public, it follows their preferences should be considered in subsequent NHS oral healthcare decisions yet this area remains relatively unexplored. This is particularly relevant

given the current climate where one potential solution to the pressures facing NHS dentistry is to reduce the treatment list available through NHS general dental practices, and who is eligible to receive NHS dental care (i.e. to move toward a 'core' service).

Previous studies have identified that quality of life and social wellbeing should be prioritised, with particular emphasis on free and emergency dental care for children as the small sample interviewed held an underpinning belief that adults can, and should, be responsible for their oral health (Fleming *et al.*, 2022). Other research estimating the value of a range of dental treatments using a societal perspective arguably reflects these concerns, with fluoride varnish offered to children who go to school in deprived areas, and supervised toothbrushing sessions for these groups receiving higher values than molar root canal or orthodontic treatment[4] (Carr *et al.*, 2021).

The following chapter adds to the existing evidence base and presents a qualitative exploration of the NHS dental offer, priorities for the oral healthcare system, the implications for equity and who should be involved in the decision-making process from the perspective of the public.

5.2 Aims and objectives

The overarching aim of this chapter is to explore the purpose of the NHS oral healthcare service from the perspective of the public. There are several objectives included in this main aim:

- Explore points of view regarding what services should be offered by NHS dentistry, to who, and how it should be paid for
- Identify priorities for NHS dentistry
- Assess the role of the private sector, and the subsequent implications for equity
- Identify who should contribute to the decision-making process for NHS priorities and services

[4] This result was dependent on the preference elicitation mechanism used, with the other methodology reversing the result and finding orthodontics and molar root canal receiving higher values than supervised tooth brushing and fluoride varnish.

5.3 Methods

The following methods section cover details regarding the development of the topic guide, piloting, recruitment, and COVID-19 precautions. Methods of data was collection and the approach to analysis have been covered in Chapter 3.

5.3.1 Ethical approval

Ethical approval for this study was attained from Newcastle University prior to data collection commencing (reference: 9206/2020).

5.3.2 Topic guide development

The topic guide was developed to address the aims and objectives set out above. Literature regarding concepts such as oral health were consulted to develop questions which would enable a deeper understanding; for example, if a participant focused on only the clinical element of oral health, follow-up questions would be asked about their opinions of quality of life in oral health. The topic guide evolved over the interview process, with the final iteration provided in the appendix, item D. One significant change was the initial interviews covered aspects of the proposed prototype reforms, such as the 'red, amber, green' traffic-light grading system of oral health proposed for use at oral health assessments. When the six new objectives for the dental contract reform were announced in March 2021, the traffic-light grading system was subsequently dropped and therefore this was dropped from the topic guide for later interviews (NHS England, 2021). Comparatively, the rest of the changes were minor.

During the interview, the definition of clinically necessary in oral health as used by the NHS was provided to participants[5]. This was introduced to enable a discussion about the (potential) difference between the participants interpretation of oral health and the current NHS provision. Furthermore, at another interval, screen sharing took place between the author and participant. This was to illustrate the difference between the services generally available via NHS dental healthcare, and what can be provided as a private practice. Again, this was to facilitate discussion about what services are available – as participants may not be familiar with treatment lists from NHS and private dental practices – and what should be available through NHS dental care. The examples provided to participants are available in appendix, item E.

[5] The definition provided is as follows: "The NHS will provide any clinically necessary treatment needed to keep your mouth, teeth and gums healthy and free of pain." NHS (2023)

5.3.3 Piloting

The topic guide was piloted with a total of six participant between January and February 2021. The pilot participants were a convenience sample made up of members of staff from within Newcastle University, with additional piloting participants recruited from within the friends and family members of the author and the supervisory team to ensure the topic guide was piloted with:

- People who describe themselves as non-users or irregular attenders
- NHS dentistry users
- Private dentistry users

These pilot interviews were not recorded and do not constitute part of the dataset used for analysis. During the piloting process it was determined that the appropriate format for the qualitative data collection would be one-to-one interviews, as opposed to focus groups, due to the length of the interviews, the range of experiences being discussed and the potential for sensitive topics being discussed. Changes to the structure and wording of questions included in the topic guide were made after piloting.

5.3.4 Sampling

To address the aims and objectives listed above it was important to capture a range of experiences. The purpose of the sampling criteria was not to generate a sample that was representative of the population, but to capture a diverse range of the population who would embody the breadth of opinions held by the general population. The inclusion and exclusion criteria were as follows:

Inclusion criteria	Exclusion criteria
Able to communicate verbally in English	Only one person per household
Aged 18 or over	
Eligible for NHS dental care in England	

Table 5.1: sampling criteria for interviews with members of the public

The purposive sampling criteria included: gender, region, age, ethnicity, use of dental services and route of access (i.e., if they are an NHS, private, or non-user, and how the service is paid for). These criteria were thought to ensure a range of experiences with dental services.

Later stages of recruitment asked participants to provide their postcode so that their IMD could be determined. Given the relationship between oral health and deprivation, asking about IMD was thought to give some insight regarding oral health needs and income. Income was not asked for directly as it raised concerns about participants not wanting to disclose this information and therefore narrowing the potential sample, and the IMD question was also optional meaning participants did not have to provide this information and they would still be eligible for interview. Whether or not people paid for their dental care was also used to provide insight into socioeconomic status.

5.3.5 Recruitment

Recruitment started in April 2021. At the start of the recruitment and data collection period various national COVID-19 precautions were in place therefore only online recruitment mechanisms were used.

The opportunity was advertised via the websites VOICE (Valuing Our Intellectual Capital and Experience) and NIHR People in Research (NIHR, 2024; VOICE, 2024). Both of these websites allow researchers to post opportunities for free and are open to members of the UK public to see and apply for. As these sites are commonly used for health-related research, there may be some concerns about the representativeness of the sample. This will be discussed in section 5.5, the discussion associated with this Chapter. A £50 voucher was offered for participation in the interview. Those who expressed an interest were asked to complete a form to establish eligibility and provide information for sampling. The opportunity was also posted on the project-specific Twitter (now X) page (@DEPENDproject). To diversify the sample, several forums on the website Reddit were approached about posting the opportunity but no responses were received (Shatz, 2017).

Participants were selected to take part in an interview to fulfil the purposive sampling criteria outlined in section 5.3.4. The sample selection process was a systematic filtering method which sought to ensure the criteria was fulfilled. The data from the forms was exported to Microsoft Excel and anonymised. Filters were then applied – firstly regarding the use of dental services, and payment method, extending to ethnicity, age and region at later stages in order to ensure the best representation of ethnicities, ages, and locations based on the available sample. The later sampling also took the IMD of the participant into consideration.

Participants who were invited to interview were provided a Participant Information Sheet (PIS) to ensure they had full information about the study and what would be expected of them if they decided to take part (appendix item F). If they were still willing to take part, they were issued a consent form and asked to complete this prior to the interview. Participants who attended the interview without returning their consent form were asked to provide verbal consent at the start of their interview, which was recorded, and later return the completed consent form electronically. A copy of the consent form is provided in item G of the appendix.

5.3.6 Study Sample

A total of 131 people completed the online form, with 129 eligible for interview. One was excluded due to being a dental care professional. Data collection started on the 10th of May 2021 and concluded on the 22nd of September 2021. A total of 22 invites were sent out, with 20 participating in interviews. One participant cancelled their original interview time and date and did not respond to subsequent emails regarding rescheduling the interview. The other participant was not eligible to participate as they did not reside in England. Interview length ranged from 1 hour and 2 minutes to 2 hours and 42 minutes with an average length of 1 hour 51 minutes.

The demographics and use of dental services for those who did take part in the interviews are displayed in table 5.2 in a chronological order. As outlined in section 5.3.4, only some participants have an IMD available.

Name	Female	Age	Ethnicity	Region	Use	IMD
Peter	Male	64	White	North East	Private (insurance)	
Maya	Female	66	Asian	London	NHS (co-charge)	
Sophie	Female	25	White	North East	Non-user	
Emma	Female	43	White	North East	NHS (exempt)	
Susan	Female	57	White	South West	Private (out of pocket)	
David	Male	35	White	West Midlands	NHS (co-charge)	
Jack	Male	25	White	North East	NHS (co-charge)	
Charlie	Gender fluid	55	White	North East	Non-user (exempt)	
Stephen	Male	70	White	North East	Private (insurance)	
Howard	Male	79	White other	West Midlands	Mixed	7
Nicola	Female	50	White	South East	NHS (exempt)	
Christopher	Male	40	White	West Midlands	Non-user (private)	7
Stephanie	Female	44	White	Yorkshire and the Humber	Private (out of pocket)	8
Michael	Male	35	Mixed	East Midlands	NHS (exempt)	2
Richard	Male	41	Black	South East	NHS (co-charge)	
Laura	Female	36	White	East of England	Mixed	10
Michelle	Female	46	White	East of England	Private (insurance)	7
Margaret	Female	84	White	South West	NHS (co-charge)	9
Simon	Male	56	Mixed	London	NHS (co-charge)	4
Chloe	Female	22	White	North West	Private (out of pocket)	2

Table 5.2: sample demographics for interviews with members of the public

5.4 Results

From the data, a framework containing four themes and seven sub-themes was developed. These are presented in Figure 5.2:

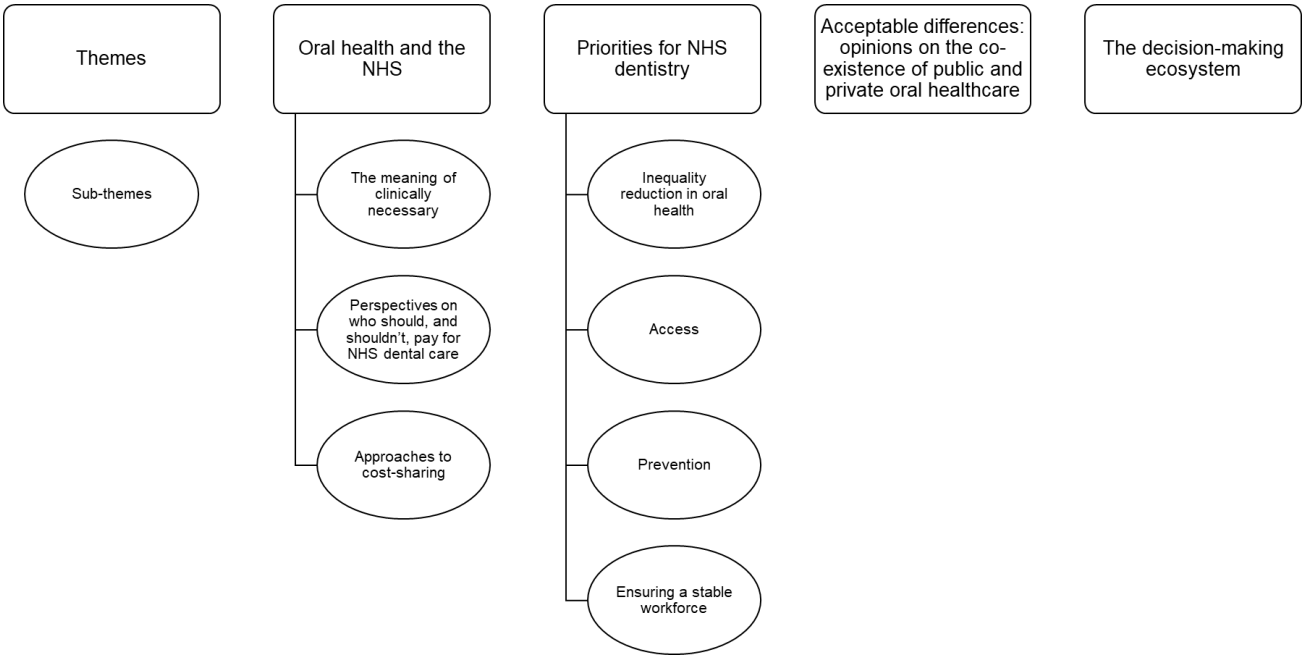

Figure 5.2: Themes and sub-themes for the members of the public qualitative chapter

This framework addresses the four issues outlined in the introduction:

- The NHS dental offer in terms of services, entitlement and funding
- The priorities of the national oral healthcare system
- Equity implications
- Who should be involved in the decision-making process

The following sections will discuss each theme and sub-theme in turn. The final section provides a discussion of the results.

5.4.1 Theme: Oral health and the NHS

The following theme explores oral health in the context of NHS dentistry from the perspective of those who pay for, and may use, NHS dental care. As shown in figure 5.2, it is split into three sub-themes, regarding the services available, who should be entitled to them, and the approach to cost-sharing. As will be demonstrated, there is no data to support the notion that exclusions should be placed on who can use NHS dentistry but instead presents considerations on the entitlement to free oral healthcare.

Sub-theme: The meaning of clinically necessary

The current benefits package for the NHS defines coverage as 'any clinically necessary treatment needed to keep your mouth, teeth and gums healthy and free of pain' – i.e. the 'benefits package' is not defined in terms of the services available, but the oral health outcomes for the recipient (NHS, 2023). Whilst there is a treatment list available, what is offered is at the discretion of the practitioner as 'clinically necessary' depends on the individual circumstances, and oral health needs, of the patient. The following sub-theme will therefore discuss the opinions regarding the oral health status the NHS oral healthcare system should provide.

As mentioned previously, the definition of clinically necessary was provided participants to facilitate discussion. Some resonated with the definition of clinically necessary used by the NHS, whilst others proposed including quality of life considerations:

> *"I think the whole [NHS treatment] list should be more about I suppose that clinical need rather than any kind of cosmetic things erm because it really shows that that's what an NHS dentist should be doing, should just be dealing with err the kind of I suppose the real issues, you know, if you've got pain then you need to be able to stop that, if you've got a hole in your tooth then yes, of course, you are going to need to fix that."*
> *Michael, 35, NHS user (exempt)*

> *"I think clinically necessary becomes more impactful if it's affecting somebody's life. Like if they're hiding away cos they've got bad teeth, like or if they're not smiling or talking, it has a huge impact on your quality of life and your mental health."*
> *Emma, 43, NHS user (exempt)*

Whilst Emma notes that 'bad teeth' can be psychologically damaging, others note that the separation between clinical oral health and cosmetic dentistry is unlikely to be binary but the system requires a clear separation:

> *"I can see there may well be some procedures needed like straightening teeth which some people would argue is cosmetic and other people would say no, your bite is bad as a result and therefore later on such and such is going to happen"*
> *Howard, 79, mixed user*

"I just think you have more of a hard and fast line saying, 'This is definitely clinical, and this is definitely cosmetic or lifestyle', you know."
Stephen, 70, private dentistry user (insurance)

Others reflect on their own experiences of NHS dental treatments, identifying that although they received clinically necessary care it left them unsatisfied, and therefore the consideration of oral health should be more inclusive:

"it is too limited. It keeps it to the barest minimum… it needs to be further rather than just prevention of pain cos then you're left – with mine I've got a horrible metal crown in it erm and a gap and I don't want to open my mouth to show my friends or strangers. You know, that's not really a satisfactory outcome"
Charlie, 55, non-user

Some took a very clear stance that cosmetic work does not constitute a clinical need, and the focus should be limited to dental disease and function:

"essentially it should be, focus should be on prioritising whether it's pathology, not where it's simply the way something looks."
Nicola, 50, NHS dentistry user (exempt)

"NHS should just be purely for clinical need and not for cosmetic reasons because if they were then offering cosmetic treatment, everyone would be going and it'd cost millions of pounds on dental work that you don't actually need."
Chloe, 22, private dentistry user (out of pocket payment)

This participant later provides rationale for this stance, citing that given the limited resources they would rather have pain addressed than cosmetics:

"why should the NHS pay £500 because someone just wants a slightly brighter smile if they can spend that £500 on someone who's in pain, who needs clinical – like urgent clinical need or someone that's got tooth decay and needs a filling?"
Chloe, 22, private dentistry user (out of pocket payment)

This a fair-innings approach, i.e. that until disease, pain and function is addressed, offering 'normal' oral health to all, the benefits package should not be extended to

cosmetic work (Williams, 1997). This was reflected by other participants in relation to making sure the services offered by the NHS reflects the evidence base in dentistry:

> *"I'd be really strict if the evidence is that there is no clinical need, I'd be cutting it and if you feel you need to go because that's the routine that you've been brought up with, and that's what you know, well you can pay, and then I think you'll find the drop off is quite sharp."*
> *Stephanie, 44, private user (out of pocket)*

> *"I guess with most things, th-, th-, there's, there's always more that can be done but it always – it's always at a price erm... and... it's making sure that, that the funds erm, are available for the greatest good erm, if the, the sort of im-, - if implants were permitted, then that would be lovely in one sense but it's going to restrict what can be offered elsewhere."*
> *Susan, 57, private dentistry user (out of pocket)*

Both these quotes allude to value for money. Stephanie speaks about only providing treatments which provide value in terms of clinical benefit – implying that the private market can meet any residual demand – whilst Susan talks about cost-effectiveness, acknowledging that there may be clinically superior treatment options, but given limited resources it may be more meaningful to spend that money elsewhere.

Others highlight that prevention is a critical part of the benefits package, reflecting the sentiment from the profession who highlighted the importance of prevention:

> *"it comes back to that difference between a national illness service and a national health service, I think the primary aim should be to make sure that everybody's dental health is as good as it can be, erm, and that starts with preventative advice, so check ups and preventative advice based on those erm, and then onto when necessary, treatment."*
> *Peter, 64, private dentistry user (insurance)*

The idea of prevention as a key part of the benefits package will be revisited in the theme regarding Priorities for NHS dentistry. One final issue to raise here is who should get to decide:

> *"Well who gets to decide? Is it their dentist or can they get supporting reports from their consultants or GPs or whatever? Like that would be my concern because a dentist isn't a specialist in other medical conditions or like mental*

health issues. So would they need supporting documentation from a psychiatrist or a psychologist or something and what would be deemed – yeah, it's how do they classify that as clinically necessary."
Emma, 43, NHS user (exempt)

Whilst this is related to individual decisions which are made when issuing treatment (often the judgement and discretion of the dentist), it is important to reflect upon as who gets to decide often impacts what is available, as was explored in section 2.2.1 regarding the different interpretations need. This will be discussed in a later section in regards to setting the national oral health agenda in the theme 'The decision-making ecosystem'.

Sub-theme: Perspectives on who should, and shouldn't, pay for NHS dental care

This sub-theme explores different ideas about who should pay for their dental care. The contextual reference point of this is the current arrangement of NHS dental care: a service which is available to everyone with a co-payment, and exclusions for some groups of the population (pregnant and post-natal people, children and those in full-time education to the age of 18, and those claiming benefits). It is important to note that no-one reflected that accessibility of NHS dental services should be removed (i.e. everyone can go to an NHS dentist), and consequently this discussion centres on who should be eligible for free NHS dental care.

Some participants reflected on the moral obligation that exists within a society to ensure financially viable dental care for everyone:

"I think you know, the healthcare, you know, unless you are in a position to be able to afford it you know, you shouldn't have to pay for it, erm, and not being able to afford it shouldn't be a barrier to getting healthcare of any kind, especially dental care."
Nicola, 50, NHS dentistry user (exempt)

"I kind of like the idea that I live in a society where we help people that don't have any means."
Richard, 41, NHS dentistry user

Others reflected the exclusions and subsidies which are currently in place do not go far enough:

“there's lots of people who are just above the breadline of receiving, of getting benefits. Who don’t go to the dentist because when they do go, of course it usually needs something expensive doing to them and they don’t feel they can prioritise it”
Margaret, 84, NHS dentistry user

All of the quotes focus on the defining factor being the affordability of care, with cost being identified as a central barrier to the accessibility of dental services. Whilst Richard and Nicola speak about the desirability of having a free oral healthcare service for those who cannot afford their own dental care, Margaret specifically reflects that in the current system low-income individuals are unable to meet the costs associated with NHS dental care, i.e. the cost of dental care shifts the perception of it as a desirable expense as opposed to a necessity. Interestingly, Nicola speaks about the ability to afford care, implying that those who can afford to pay for their oral healthcare should, and therefore that NHS dentistry should not be free at the point of use as with other health services in England.

Other participants reflected specifically on the existing policies, noting that blanket policies regarding free dental care for peri and post-natal people and children could be considered unfair as there are people and families who fall into these groups who can afford dental care:

“I think as a broader thing, going back people that can – that have free dental care but maybe can afford that, if, if they could maybe look at that again or review that erm, and then use that money to, to do some outreach services, I think would be – yeah, would be best”
Laura, 36, mixed user

“I think it’s income really, is the most important. I mean pregnant, would probably be the least important because I think you can be very well off when pregnant can’t you? So, erm, yes, I’d be more, if I was doing anything, I’d be more focused on financial streaming… Children, again, I think it’s probably fair but if I had to cut it anywhere, I’d cut it for a blank policy for children, because again, children come from families of vast differing wealth and perhaps the focus should be on children who erm, you know who come from poorer backgrounds, so they get more and then the middle class child, you know

parents have to pay."

Stephanie, 44, private user (out of pocket)

Both of these quotes speak to an unfairness which is created by policies intended to make dental care or oral health equitable, i.e. achieving horizontal equity for certain groups of people, but arguably has the consequence of removing resources from groups who require them more, implying a vertical equity approach related to need might be more appropriate. Some participants argued that the current provision of free care was overlooking some groups who either need financial and practical support:

"if you're disabled you should probably get help, long-term health conditions I think should get help as well cos it's so stressful looking after everything that I think you know, I think that kind of group – well, should get all the help that they can"

Michelle, 46, private dentistry user (insurance)

"I was just mulling over why children are prioritised. What about older people who have lost all their teeth? And I'm thinking, for a number of years I looked after my elderly mother. Erm, and for the last part of her time, erm, she was in a care home and the number of older people there with no teeth, not able to eat properly."

Margaret, 84, NHS dentistry user

Again, this reflects a vertical equity approach with those with the highest need and dependency on NHS dental treatments should be prioritised.

Sub-theme: Approaches to cost-sharing

As documented in the background section, charges to NHS dental services were introduced in 1951. The frame of reference therefore for most participant is therefore that NHS dentistry has a co-charge. Some reject the idea that cost-sharing is a necessity, whilst others worried that removing costs entirely would lead to moral hazard:

"Offer [NHS dentistry] free for everybody, universal dental care like universal healthcare. It should never have been separated."

Charlie, 55, non-user

"I would feel, if the NHS went free completely… there are people there who would think 'oh well, ok, dentures are free now, I can do what I like' and that will not help the rest of the population because they will be inundated with customers sitting there with you know issues which could be self-inflicted."
Maya, 66, NHS dentistry user

Similarly, some felt that paying for care acts as an incentive mechanism to encourage people to look after their oral health as they are investing monetarily:

"I'd say like if you're paying quite a bit of money out of your own pocket, you, you may like look after your dental care a bit more because you know that if you need any dental work, it's going to cost you quite a bit of money."
Chloe, 22, private dentistry user (out of pocket payment)

Whilst some agreed that dental care needed to be paid for, they disagreed that it should be a co-payment system which can create barriers to accessing dental care (as noted in the previous sub-theme):

"I think you don't ever want there to be a barrier. So I think I'd rather see, I'd rather even be taxed the same amount or more and not pay it there"
David, 35, NHS dentistry user

"Well, [laughs], sorry, I don't mind paying another extra penny or two on my tax for, for proper dental care."
Stephen, 70, private dentistry user (insurance)

This approach would instead increase the pool of initial funds through tax, and removing the necessity of payment would therefore establish the oral healthcare service as a quasi-public good. Another participant emphasises the importance of cost-sharing for dental care for those who can afford it, since the provision of dental care is costly. Another notes that co-payments are needed to enable the provision of *quality* dental care:

"I think that's proportionate, I think that's realistic given that there is a cost attached to providing dental care. I think it's proportionate and morally and practically right that there should be a co-charge for those who can afford it."
Nicola, 50, NHS dentistry user (exempt)

"I'm a realist and I don't think we can fund absolutely everything to the highest standard. I think there probably is some element of needing to take co-

payment but erm, co-payments for decent care, isn't it, not just a co-payment"
Stephanie, 44, private user (out of pocket)

These points of view from Nicola and Stephanie offer an interesting contrast to David and Stephen. All discuss the need to fund NHS dentistry but have difference preferences regarding how payments should be made (increased tax, or co-payments). Others spoke about contributions relating to treatment needs:

"I think if you cost the NHS more, you should be contributing a bit more because I think it's only fair."
Chloe, 22, private dentistry user (out of pocket payment)

This more closely reflects an out-of-pocket private dental care system where a patient is charged according to items of treatment they receive. The opposite point of view was also observed – those with extensive treatments needs should be supported more:

"There could be some sort of subsidy for people who need a lot of treatment so they're not, they're supported rather than feeling they have to be forking out for it."
Simon, 56, NHS user

It is interesting to observe both points of view. Whilst Chloe frames high needs as a high financial burden on the oral healthcare system – and therefore the individual should share that – Simon frames it as high needs creating a high burden on the individual, and therefore the state should help. The differences between these stances could potentially be linked to their opinions on personal responsibility and oral health, i.e. whether or not a person is responsible for their oral health, and therefore if it is equitable for them, or the state, to pay for their healthcare.

Some suggested that there should be means testing, i.e. that patients should make contributions based not on the volume of treatment required but based on their financial status:

"I think there's some means testing that could be done instead of it just being across the board."
Emma, 43, NHS user (exempt)

Again, this moves the focus away from the cost of care, and instead centres it on the affordability of care. This reflects the sentiment evidenced in the previous sub-theme 'Perspectives on who should, and shouldn't, pay for NHS dental care'.

5.4.2 Theme: Priorities for NHS dentistry

This theme discusses priorities for NHS dentistry across four sub-themes: inequality reduction, access, prevention and stabilising the workforce. What is not included here, but could also be considered a priority, is oral health itself. It is not developed as a sub-theme here as often it is the underlying goal of the four included sub-themes – i.e. reducing inequalities, improving accessibility of oral health services, increasing prevention, and ensuring there is a large enough workforce to achieve these will most likely lead to improved oral health outcomes. For example, David states that the aim of the oral healthcare system should be no dental disease:

> *"The overall aim should be a populous with healthy teeth and good oral hygiene that are able to receive the care they need when they need it."*
> *David, 35, NHS dentistry user*

What is not clear from the above quote is how it should be achieved. Improving access and prevention and stabilising the workforce can all be thought of as goals in their own right, but ultimately they are also methods to improve oral health. Inequality reduction is the desire to improve oral health but for a specific sub-group of society: those with the worst oral health. This can be thought of diagrammatically, as shown in Figure 5.3:

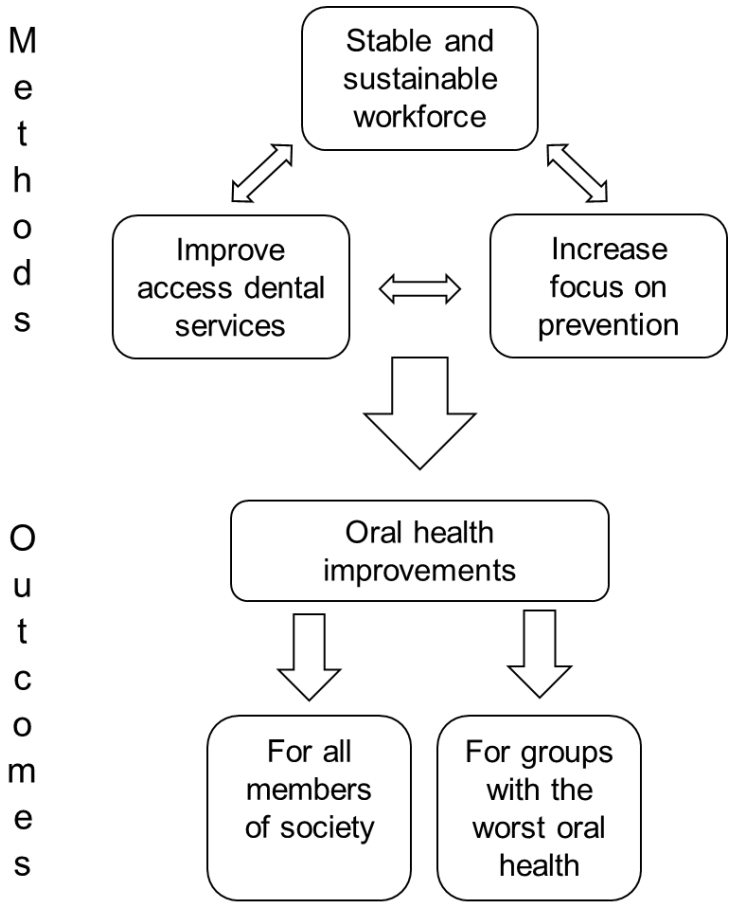

Figure 5.3: linkage between methods and outcomes for NHS priorities

As Figure 5.3 demonstrates, these factors are often interlinked. If a participant wishes to reduce inequality, they may speak about increasing prevention. Sophie for example talks about prioritising access in order to reduce inequalities:

> *"I guess for me, my priority is access, but I think that sort of idea of widening participation because I'd almost rather every, you know six to seven, however many million people there are in the country, I'd rather all of them had standard levels of health, like of dental health than 20% have excellent health, if you know what I mean, I'd rather everyone was sort of on an even plane field across the country."*
>
> *Sophie, 25, non-user*

The triangle of methods once again highlights the intersection and overlap of these three priorities – a stable workforce is required to improve access, and more accessibility may increase prevention, whilst better prevention may relieve pressure on the workforce to allow for improved access. The outcomes section indicates that

by improving oral health – even if strategies are targeted – there may be improvements for all.

Sub-theme: Inequality reduction in oral health and oral healthcare

Some participant expressed a desire to prioritise those with the worst oral health and therefore reduce oral health inequalities:

> *"I think they should be thinking more about health inequalities and dental inequalities. And erm, what maybe done to improve that, because it is now policy and it is up to them to do something about it."*
> *Margaret, 84, NHS dentistry user*

> *"I think we need to work – or like the NHS needs to look a lot harder and erm, you know, like closing the gap, you know, between, you know, the oral health inequalities."*
> *Chloe, 22, private dentistry user (out of pocket payment)*

One participant supported their beliefs of inequality reduction as something which would benefit the individual, the healthcare system and wider society:

> *"I think it can cause such pain and discomfort and it can make such a difference to the quality of your life, and have knock on effects on all aspects of functioning and wellbeing, and ultimately on your ability to contribute to society. Erm, if you target the neediest everyone benefits ultimately."*
> *Nicola, 50, NHS dentistry user (exempt)*

Others had concerns about prioritising inequalities. Some noted that although it is a worthwhile cause, there may be issues in both reaching the groups who require treatment and their desire to utilise the treatment offered:

> *"I imagine the people with the worst teeth generally are those living in sort of extreme poverty, so, I do think that they're going to be the hardest people to reach. Erm, so, yes, definitely efforts should be made to reach those people, but I don't think it's an easy task."*
> *Sophie, 25, non-user*

Another spoke about their concern that they, as someone with moderate oral health, would be potentially marginalised if programmes were instated which targets those with the worst oral health:

"If I have a moderate to good oral health, I don't need the prevention side of things because I'm already doing that. [If] I have moderate oral health and I need emergency treatment, I got, all of a sudden I get dental disease, like periodontitis or something like that, then, there needs to be a system or a pathway… [If] you still have reasonably good choppers until you're 65, or whatever, I don't see why you can be a lesser priority"
Stephen, 70, private dentistry user (insurance)

Others spoke about inequality reduction in terms of ensuring both the quality of service and the services available between NHS and private dental care being equal:

"[If] I had a limited amount of money from the state, I would put it into offering good, better quality care for people with the worst oral health, who can't afford it. Rather than a, open your mouth, erm, 20 quid, for people who could actually probably afford 30, 40 quid… Erm, but I think it's a limited pot of money, isn't it? I think it's better to focus, I think it's better to give high decent quality care to fewer people than it is to give mediocre care."
Stephanie, 44, private user (out of pocket)

This links back to the idea already discussed about the affordability of dental care being critical, and argues that offering free, high-quality care to those with the worst oral health is more meaningful than offering limited care to everyone.

Sub-theme: Access

This theme discusses access in terms of availability and affordability of appointments at a population level as a priority for the NHS, and in some cases considers the potential consequences for oral health. Often participants touched upon several areas in their responses, acknowledging how interlinked the issue of access in dentistry and the provision of dental care is.

Participants discussed ensuring people can access appropriate services in an appropriate timeframe to address their 'basic needs':

"Making sure they see patients when they need to see them and making sure they see patients when they're in pain. So making sure they're flexible to the patients and meeting the patients' basic needs is also what NHS dentistry should be."
Chloe, 22, private dentistry user (out of pocket payment)

Whilst this participant is discussing the availability of healthcare services, underlying this is the idea of health, with healthcare services being a method to achieve or maintain health. Other participants discussed this notion explicitly – that the overarching objective and priority of the NHS should be the oral health of the people, but in order to achieve that access is critical:

> *"Well given that the knock on effect of keeping or not keeping the mouth healthy is people a) suffering pain and b) possibly losing their teeth, I think that clearly erm, oral health is exceedingly important… But then if a) you can't get an NHS dentist and you certainly can't afford private dentist. And if health, if national health charges prevent you from seeking erm, oral health care, then its all bound up, everything is affected by everything else."*
> *Margaret, 84, NHS dentistry user*

Others also emphasised that the role and priority of the NHS should be to provide care to those who cannot afford treatment otherwise:

> *"I suppose for me basically it just means going back to the reason for why the NHS was constructed in the first place really which was to help kind of provide care and erm well just care I suppose to people that can't afford erm treatment in any way kind of shape or form"*
> *Michael, 35, NHS user (exempt)*

Some took a long-term view on this stance, arguing that if dental care is affordable and accessible then dental disease can be identified and treated before it progresses:

> *"not everybody can afford private fees so people do get put off and then it comes to a stage where they would end up in a hospital, you know, end up in A&E actually, that's where you know you get backlogs and something that of course they don't want to see but have got no choice"*
> *Maya, 66, NHS dentistry user*

Maya hints toward the idea of efficient resource use, emphasising that if dental services are not available to all then the spillover is not contained to dentistry but will seep into other healthcare services. Others reflect on the cyclical nature of availability and workforce, that in order to improve accessibility you may also need to address the profession and it can be difficult to identify which should be prioritised:

"I would say having everybody have access would be the first thing, but then before that you need the dentists and the hygienists and the receptionists and the nurses. So do you invest in – it's a chicken and egg thing isn't it? Do you invest in training and then getting people into the profession or do you invest in buildings that are accessible and local and in the right areas so that you've got the right – it's like having schools isn't it?"
Emma, 43, NHS user (exempt)

Some reflect that making services available is only a partial solution, that without ensuring people know what is available, and when and how to access it, more appointments will be underutilised:

"So, it strikes me that that accessibility is really, really important. Erm but should be a given. But then erm, the education to get people to take advantage of that accessibility should also be there which doesn't seem to be."
Peter, 64, private dentistry user (insurance)

This highlights the importance of true equality of opportunity: it is not just a case of ensuring the service is available. Another emphasises that in order to be impactful, the priority should be both accessible and high-quality care:

"I think it's much more than getting through the door, I think. Erm, absolutely standard of care as well, absolutely, there's no point in just getting through the door."
Stephanie, 44, private user (out of pocket)

Others made sure to highlight that prioritising accessibility means making the service accessible to everyone, that beyond affordability there are other characteristics which must be catered for such as longer appointments for anxious patients or facilities to ensure practices are literally accessible. Emma talks specifically about disabilities but other participants spoke about language and cultural issues:

"Being a disabled person accessibility is so far down the list of anything when things are getting designed or implemented and society goes on the medical model of disability and how to treat it and how to interact with it because of like historical biases and prejudices and the social model is that the world just

needs to be accessible because then it'll help everybody."
Emma, 43, NHS user (exempt)

Sub-theme: Prevention

The first thing which should be mentioned when discussing prevention is the very nature of prevention itself. Prevention acknowledges that decline is likely, unless efforts are made to halt or slow deterioration. This is particularly true in oral health, as with the exception of people born with genetic conditions the majority of people are born with, and capable of, good oral health across their lifecycle (Peres *et al.*, 2019). This can be achieved – but also is not guaranteed – by oral health behaviours. This sentiment was reflected by the participants, who spoke about the importance of prevention early in life:

"most people start their lives with good teeth and erm with better preventive care perhaps and greater taxes on sugar we would spend our lives not needing so much dental care, not needing all these expensive – what would obviously be expensive treatments even for the government to provide"
Charlie, 55, non-user

"I'd rather prevent things from getting worse from the very beginning than getting to a stage where we won't even think like oh we'll deal with it when we cross the bridge, because by that time the bridge has come and gone and things have got worse so no, I am the kind of person I want to prevent it right from the beginning. Yes if you can't, fine, but at least you've tried."
Maya, 66, NHS dentistry user

When exploring their reasoning for prioritising prevention, some identified that preventative options are less complex than curative treatments whilst others justified their stance using an economic rationale:

"If people's teeth are not well looked after then that can lead to all sorts of problems which will cost the taxpayer more, erm, therefore as with any other health thing it is best to keep everything working as well as possible and doing what it's supposed to be doing as long as possible and that's what dentistry services do for oral health."
Howard, 79, mixed user

Exactly what form prevention services should take, and how exactly to achieve this, was also discussed. Whilst some spoke about the role of regular oral healthcare (i.e. improved access as a route to prevention), many highlighted the role of education as an essential route to achieving greater prevention within the population so individuals are able to maintain or improve their oral health outside of a primary dental care setting, with some suggesting national public health campaigns:

> *"maybe it is access because if people can have check ups more often they can get something small done rather than leaving it and then suddenly they need something big done, they've been left for a while, that would be the first priority."*
> *David, 35, NHS user*

> *"I think there needs to be a formal, er, objective to educate the public, er, I think it comes across, it need to come across quite informally I think that's the way to reach people and make it more, I mean there could be programmes in schools, er, there could be campaigns on television"*
> *Simon, 56, NHS user*

Given the potential differences in funding pathways between programmes in schools and television campaigns, the issue regarding who should be responsible for the role of education in oral health was discussed and gathered an array of opinions. Some felt like the responsibility should be shared between all potential contributors to oral health, whilst others placed the responsibility with the dentists who work within the NHS:

> *"I think it's everyone, everyone: parents; governments; erm, yeah, practices. Literally, everyone erm, sharing knowledge and, and sharing responsibility, yeah."*
> *Laura, 36, mixed user*

> *"[I] think it needs to be something we're encouraged, that we're educated on visits, yeah the role of NHS dentistry could be more educating people and putting them in charge of their healthcare. There's somebody there to help us and guide us through the process, our dentists and our hygienists, where it's ultimately up to us."*
> *Simon, 56, NHS user*

Others spoke about the profession working in tandem with the government to help identify effective strategies for prevention:

> *"there's no point just saying, 'Oh, they should spend more money in the NHS', because there isn't any more money. You have to make money from somewhere, or you have to find it… Er, if you want to spend money in the future, you need to save it now, you know. So it seems to me that prevention is a key aspect of it and to be honest, I think there's not enough… Um, government doesn't listen to dentists enough."*
> *Stephen, 70, private dentistry user (insurance)*

Sub-theme: Ensuring a stable workforce

The following sub-theme reflects on the cyclical nature of dentistry. That, although the other sub-themes are valid objectives, they cannot be achieved without the workforce. At its core it is a supply issue, as explored in the previous chapter. The public participants reflected on issues relating to education, recruitment and retention. One participant discusses that when dentists decide to go into private practice, they are limiting the availability of appointments for those who rely on NHS dental services:

> *"the majority of the people would go to an NHS dentist and over the years there have been fewer and fewer NHS dentists, they all tend to become private and I think that way that puts the population, a percentage of the population off, err, going to the dentist [yeah] and that doesn't help long term, that is quite a big burden on the NHS long term [yes] so I think the NHS need to tackle this much earlier on rather than erm having to have so many dentists go private and less of NHS because what will happen is in the end that patient is going to end up in the hospital because of poor oral health, oral hygiene."*
> *Maya, 66, NHS dentistry user*

Another participant emphasises the need for sufficient training at University level to ensure there is a sufficient workforce to cover demand for NHS dental services:

> *"then looking at, um, long-term accessibility, um, you just need to train more dentists. You need to put more money from the education budget into training dentists"*
> *Stephen, 70, private dentistry user (insurance)*

As explored in the previous chapter, having enough people trained is only part of the issue and underlying this is the NHS dental contract and consequently the stability and sustainability of labour in the NHS dental service.

5.4.3 Theme: Acceptable differences: opinions on the co-existence of public and private oral healthcare

The previous themes have discussed oral health in the context of NHS dentistry and the priorities for the oral health service. This theme takes a broader perspective and considers the co-existence of NHS and private dentistry, i.e. if there continues to be a public/private divide in dentistry, what differences between the two services are considered acceptable. This is related to the earlier theme regarding oral health and the NHS, and more specifically about oral health as a quasi-public good as it speaks to what we, as a society, would like to guarantee those who depend on the NHS for their oral healthcare. It also extends the consideration to what should only be accessible for those who have the ability to pay for private care, and therefore what can – and is acceptable – be commoditised according to free-market principals.

For some, there was no acceptable difference between public and private oral healthcare services:

> *"dentistry generally isn't a luxury treatment. Although there are cosmetic aspects to it, those cosmetic aspects are to do with real quality of life improvements that poorer people can't access and those should be made available to poorer people. Not narrowing them down to just the most basic treatments for poor people."*
> *Charlie, 55, non-user*

Charlie argues that dentistry – inclusive of cosmetic treatment – is a healthcare service and should not be considered a luxury only affordable, and afforded, to some. The notion of teeth being an indicator of wealth and a 'luxury' item was raised by another participant:

> *"I think teeth are increasingly going to become a characteristic of social class. And again, we are a wealthy country, this is 2021, you know, come on. Really teeth shouldn't be a sign of whether you've got a few quid in the bank or not, it's terrible, terrible."*
> *Stephanie, 44, private user (out of pocket)*

"I'd like to think we live in a good society and I think people who aren't lucky enough to have a high income should be happy to open their mouths to strangers [laughs] and not be ashamed of their own mouths."
Charlie, 55, non-user

The second quote from Charlie is particularly striking as it talks about what having good teeth really means at an individual level, and that what people are able to purchase in the private sector – what is being commoditised – is the absence of shame.

Some returned to the underpinning constraints of publicly financed oral healthcare, stating that everything for everyone is idealistic:

"In an ideal world, I wouldn't have private dentistry and I would have an amazing dental service that can provide all this, but you know that's just not society, but I do think the NHS have got their priorities covered in that what they're providing will serve the clinical need."
Sophie, 25, non-user

A recurrent idea in this theme raised directly here and underlying the previous quotes is about what we, as a society, want and desire for the population and how this is reflected in what NHS care is available – particularly for the services and treatments for those who depend on the NHS for their oral healthcare:

"there's a standard that we as a society are willing to pay for. And that's provided by the NHS. Erm, that as we've discussed is above minimum so you know we will, an NHS dentist will repair a broken tooth, won't just fetch it out, erm, will provide a denture to replace things, won't just say, you know go away and gum stuff. Erm, you know so the standard is not a minimum standard, its better than minimum."
Peter, 64, private dentistry user (insurance)

Across these four participants there is a range of perspectives – Charlie and Stephanie discuss what we should be striving to achieve as a society, whilst Sophie adopts almost a reluctant realist stance, with the final quote demonstrating someone fully committed to the public/private healthcare mix. Here, it is also important to reflect that Peter is a user of private dental care. They provide an outsider perspective on the NHS dental service and describe the offer as something which is

‘above the minimum’. The lived experience of Stephanie, who was using an NHS dentist but moved to private dental care, provides a stark contrast to this:

> *“I don’t know whether they’ve gone wrong or whether the NHS dentistry, who seems to be more manana, manana, manana and then till it’s too late and then they pull them out. Whereas I didn’t want mine out, I’d rather have them root canaled and crowned. But I am very lucky, I’ve got the money, I can do that but, I appreciate a lot of people haven’t got the money. That will be one of my points, I think the NHS seems to sort of pull teeth a bit too quickly.”*
> *Stephanie, 44, private user (out of pocket)*

It is important to contrast the perception of those outside of the system and those within it, with Peter describing a service which offers ‘above minimum’ standard of care whilst Stephanie felt their needs were not met with an NHS dentist and now seek care from a private dentist, reflecting that they feel ‘lucky’ to be able to do so – something which is not afforded to everyone. Whilst this could be considered a one-off scenario, it could also be emblematic of the difference in the quality of care between NHS and private dentists. Others reflected this in terms of the time and attention they feel NHS dentists can afford:

> *“I’ve found that with the NHS dentists some of them try to really rush you in the sense that you know ‘trust us, trust me, what I’m doing is I’m doing what I have to do as a dentist’ which, to a certain extent I agree, then I think as a patient I like to know what you are doing for my teeth”*
> *Maya, 66, NHS dentistry user*

Although the experience of Stephanie is potentially an extreme example, the experience of Maya speaks to the systematic issue of time created by the UDA system, as explored in the previous chapter. This highlights how time and communication are now arguably commoditised by the private oral healthcare market. Other private users however expressed a similar sentiment to Peter:

> *“the treatments which the NHS already offer are considered good enough, sufficient. So unless that changes… As a poor person I would say, ‘Well, that’s, that’s what it is. You know, my dentist has told me that gold is better, but if I can’t afford it, I’ll just have to go with the bog-standard treatment, which is, you know, acceptable to all the NHS’... In other words, if the NHS thinks it’s a good treatment, then, you know, in some ways there’s a two-tier system, but,*

in other ways, you're still getting a functional treatment"
Stephen, 70, private dentistry user (insurance)

This highlights that some participants think that having differences in the treatment available is acceptable and extends to the materials to be used in their treatments. This particular participant goes onto discuss (dis)advantages in oral health relating to ability to pay as a willingness to invest:

"I know there's people that just never will be able to pay for it, but I think that one of the reasons why we get ahead in life, generally speaking, is because we're willing to make an effort to, to go that extra yard to, to pay for something... And I think part of life is saying, well, there, there will always be some people who can afford to pay for a premium kind of treatment, which is just as good as the treatment I'm exactly getting, but I just don't have, can't pay for the gold, so if you see what I mean. So I think that if the NHS thinks that a treatment is good enough, it is perfectly acceptable clinically and health-wise that I don't think the poorer people should necessarily feel disadvantaged"
Stephen, 70, private dentistry user (insurance)

This emphasises the view of oral health as an investment, implying an underlying belief of meritocracy and wealth accumulating as the result of hard work, and therefore if the premium treatment options are not affordable that is a consequence of individual choices. Given these beliefs, for this participant the 'two tier' system created by the NHS and private dentistry split is equitable but is also underpinned by the belief that NHS care is 'good enough'.

Whilst others do not echo the same sentiment of the distribution of wealth being equitable, or a result of effort made across a lifetime, they do discuss that extending the NHS dental offer should involve paying for additional services:

"I think the NHS dentists can offer those services but they would be paid-for services. I would expect them to be able to offer them, but with the rider that the full cost is paid by the patient."
Susan, 57, private dentistry user (out of pocket)

This closely echoes the current set-up, where dentists can provide NHS and private treatments, but allowing dentists who work within the NHS to provide treatments

currently available only through private dental practices as NHS services in a fee-for-service basis. Others raised questions about the ethics of paid for NHS services which are cosmetic:

> *"possibly the NHS could offer cosmetic treatments for a payment but then is it ethical, right, because the NHS is not about making money but helping people."*
> *Christopher, 40, non-user (private)*

For one participant, the idea of the NHS providing paid-for services which did not have a clinical benefit was unacceptable. During a discussion around a randomised controlled trial of routine scale and polish treatments, which indicated there is no harm but no clinical benefit of issuing the treatment at a six monthly basis, one participant stated they believed that the NHS providing this service at a charge to be unethical:

> *"I don't think, I don't think, that would not be clinically or ethically proper [for NHS dentists to offer treatments which are not clinically necessary], no… [but if patients want to access the same treatment privately] Oh gosh, if that's what they wish to do yes, that's human choice, free choice."*
> *Nicola, 50, NHS dentistry user (exempt)*

This reflects the idea that NHS dentistry should exist only to address oral healthcare needs, leaving private care available to satisfy wants. Others defended the idea of paid for treatments in the NHS, arguing that if dental practices are charging for services this can be reinvested into public prevention campaigns:

> *"I would say it is ethical yeah, I'd be fine with it if that money were put to good use in promoting healthcare. They could use that money to fund [a public health campaign about dentistry]. Yes the NHS needs money, it's not, it needs to be generating an income as much as being funded… The money would be there to support the structure and pay dentists a fair wage and make sure there's PPE available and all the equipment and all the practices were, er, equipped to a certain standard. That's where the funding would come and they'd need money, it needs to self support itself."*
> *Simon, 56, NHS user*

Some felt like separating out additional treatments as paid-for services through private practices was entirely acceptable, but reinforced that the primary concern in either sector is to meet immediate oral healthcare needs:

> *"I would say that the private dentists have a duty of care to provide anything that the NHS do, but then if they want to offer extra stuff I don't think that necessarily applies the other way that the NHS then have a duty to offer the same erm, interventions or treatments."*
> *Jack, 25, NHS dentistry user*

Some discussed the existence of private care as positive since it offers people options, however in order to make them accessible and a realistic choice there should constraints on how much cosmetic treatments can cost:

> *"I think perhaps that maybe the aesthetic aspect, that is something that erm, you should pay erm, pay for erm, yourself. Perhaps fully but still within let's say, within some set rates, not some like ridiculous amounts."*
> *Christopher, 40, non-user (private)*

> *"[My sister was] telling me the other day that she wanted to go to Turkey to get some dentistry and I was just like, why are you going to Turkey, and like Turkey's not related so if anything goes wrong over there you're going to have to come back and use an NHS dentist aren't you to fix it all up. And it's just, it's just giving people options so they're not going to Turkey to get their teeth sorted out or cosmetically enhanced or whatever you call it."*
> *Richard, 41, NHS dentistry user*

The last quote from Richard mentions in passing a subject which is gaining more attention: health tourism, and more specifically what happens or what should happen when procedures received abroad create problems which then have to be treated in the individual's residential country. Their argument is that by offering the treatments through the NHS, at a reasonable cost, there could be cost savings in the long-term as less resource will be used correcting dental work received from abroad. Similarly, one participant also felt that the existence of private care may actually help alleviate some of the burden on the NHS:

> *"you know if I was a millionaire, there's no way I would be using NHS resources, by going somewhere and paying a co-charge. Like, as much as I*

don't really agree with the concept of private healthcare, that is the way it is. And I would rather not burden the NHS."
Sophie, 25, non-user

5.4.4 Theme: The decision-making ecosystem

The following theme addresses who should be involved in the decision-making process. The term 'ecosystem' is used here to describe the complex network of parties who hold interest in the process.

A key thread interlinking the thoughts expressed in regards to decision making was balance. Balance needs to be achieved across two spectrums: firstly, balance across the policies themselves – striking an equilibrium between what is possible, what is affordable and what is desirable, a common undercurrent in this chapter. Secondly, balance across the key actors – the public, the patients, the professionals and the funder:

"you've gotta get that balance between what the patients want, what's physically possible and then what's affordable. So it's got to be a collaboration between the funding providers, the dentists and the patients. It shouldn't be one body gets more of a say than the other.."
Emma, 43, NHS dentistry user (exempt)

"you've got your expert panel, erm, like your policy maker panel like funder panel, however it ends up shaking out, and then like a lay/patient panel of some description who have been informed on what potential outcomes there are and I suppose, yes, it's never easy to try and get them all to agree of course, but I suppose that would be the path I would go down if somebody had asked me to put it together."
Jack, 25, NHS dentistry user

However, some participants reflected that public engagement is necessary, but there are issues regarding diversity and respect for members of the public on panels:

"I also think with it being an NHS service, like, you do need public engagement, like you do need to almost involve the public in decisions because you know it's a taxpaying service. So, I think that's a pretty strong priority as well."
Sophie, 25, non-user

"I've never felt that our comments have been held as highly as clinicians and dentistry is something that's very specific. So I find it really hard to go on that, but I would expect if not equal, almost equal if that makes sense. I wouldn't want to be a kind of add on at the last minute to be asked right at the end of the process what do they feel about something."
Michelle, 46, private dentistry user (insurance)

Whilst some felt that the public should have a controlling say in the decision-making process to ensure a useable service for the patients, others worried that consulting the wider public might not provide useful input:

"I think actually putting erm people slightly almost in charge of the service so how I mentioned to you about hospital services and how they try and co-produce a co-design type ideas, I think that you know if patients are happy to come together and really be able to kind of focus in on their local dentist, say this is how we would like you to almost work, because actually one thing that I've learned is that you know professionals don't have all the answers and what they see as a priority isn't actually a priority to the general population."
Michael, 35, NHS user (exempt)

"when it comes to [public involvement] like that, I just think, you know, 'Yes, consult the public but, again, take it with a pinch of salt,' because it's, it's not – you know, erm... yeah, I, I don't know how you would do that sensibly [laughter], so you don't end up with, with like a Boaty McBoatface result[6]."
Laura, 36, mixed user

Stephanie speaks more generally about the difference between input and decision-making power, highlighting the asymmetry of information meaning they may not possess the correct knowledge to reflect their ideal outcome:

"I think they should have an equal voice but not necessarily an equal stake in the decision making in the end because it's back to the, you know don't know what you don't know… you know it's respect for other people's knowledge isn't it really, in both directions. You know, it's a respect for somebody who really does know what they're talking about but it's also a respect for a patient

[6] Boaty McBoatface refers to when the British public were given the opportunity by the Natural Environment Research Council to name a new Royal Research Ship in 2016 via an internet poll. Boaty McBoatface won, receiving 33% of the popular vote (with second place receiving 11%).

viewpoint of, I really don't want black teeth, you know that's a really valid point. Erm, so, I think it's, but ultimately, I think the public purse has got to balance itself out as well because otherwise we can be aspirational and idealistic as much as possible but it's not sustainable. So, I think ultimately the person who has got the eye on sustainability probably has more of a weight on the vote."
Stephanie, 44, private user (out of pocket)

Stephanie therefore argues that the ecosystem must be built on mutual respect, and an acknowledgement of diverse viewpoints and different knowledge underpinning that although patients and the public will have valuable thoughts and opinions about NHS dentistry, they may not have the knowledge required to make resource allocation decisions. It is also important to reflect on the willingness to engage with the task at hand, for example the below quote from Charlie:

"We're a country which is currently in the process of spending tens of millions of pounds upgrading our nuclear weapons systems. If we can do that then I think we can give good quality dental care or is it more important to blow up millions of people? Sorry but that's the government we have. That's Britain today. We say we have these choices to make, I don't think these choices are real. I think we are just – we're kidding ourselves if we think that erm we don't have the money. We do."
Charlie, 55, non-user

This demonstrates how engaging with members of the public in a decision-making context can be difficult, although it is perfectly valid to hold an opinion where funding for NHS dentistry should be bolstered in order to improve the NHS dental offer, it also does not provide further information regarding what they believe should be prioritised within NHS dentistry, which is the constraint NHS England and NHS oral health services have to work within.

5.5 Discussion

This chapter has explored the public perspective regarding the purpose of NHS oral health care in England across four themes. These themes address four key issues facing the oral healthcare sector: what the NHS dental offer should be, the priorities for NHS dentistry, equity and the role of the private sector, and finally who should be involved in decisions regarding NHS dental services. Given the current issues facing NHS dentistry in terms of access, the ongoing dental contract reform and the

evidence presented in the previous chapter from the workforce, it is evident that NHS dentistry is at a crossroads where decisions about what should be prioritised in terms of the national agenda, and what should be available at an individual level, need to be made. This chapter therefore provides valuable evidence from a diverse group of the general public which can feed into the decision-making process about the scope of NHS dentistry and the priorities for the oral healthcare service.

The first theme, Oral health and the NHS presents three sub-themes which cover the public opinions regarding the purpose and practicalities of NHS dentistry. 'The meaning of clinically necessary in the NHS' explored the concept of oral health in a system which is constrained, whilst 'Perspectives on who should, and shouldn't pay for NHS dental care' discussed not who should be able to access NHS dental care, but who should be considered exempt from paying for their oral healthcare. The final sub-theme, 'Approaches to cost-sharing' focused on how payments should be made in the context of the NHS. These three-sub themes can be mapped to WHO coverage cube (as presented in Figure 5.1) as the three dimensions of the cube are a reflection of those who are identified in this theme (World Health Organization, 2010). However, the data presented in these themes shows a large diversity of opinion, with some advocating for all dental services available to everyone, and others viewing the purpose of NHS dentistry as the absence of disease and functional oral health. This raises issues for equity, i.e. what is fair to be commoditised by the free-market, and what standard of oral health should be available to those who are dependent on the NHS for their oral healthcare, and the consequences for inequalities. This was discussed in the theme 'Acceptable differences'. The theme 'Priorities for NHS dentistry' identified four key areas for NHS dentistry to target in order to improve the oral health of the nation: inequality reduction, access, prevention and ensuring a stable workforce. The final theme considered how decisions should be made in NHS dental care, noting the broad array of interested and influential parties and the balance which must be struck between these groups.

Across the themes the data demonstrates a diversity of thoughts and opinions regarding NHS dentistry. Considering the data in relation to the first theme – Oral health and the NHS – it is clear that there is no consensus on what oral health in the context of NHS dentistry should mean, i.e. there is no singular 'what' in terms of oral

healthcare services or oral health outcome which will satisfy the general public. Some participants advocate for an oral healthcare system which will focus on disease and function, whilst others believe that oral healthcare in the NHS should be inclusive of aesthetic and cosmetic components. It is therefore interesting to observe a degree of consensus regarding who should benefit – that financial hardship should not prevent someone from accessing NHS dental care. This is a reflection of the ideological pull documented in Chapter 4, that the NHS is associated with helping those with no other recourse, and can be linked back to the idea of expenditures a person ought to have as outlined in Chapter 2. However what is potentially more controversial how this idea was operationalised by some participants. Participants spoke about the blanket policies which allow for groups of people to access NHS dental care for free (specifically children, pregnant and post-natal people) achieve horizontal equity – equal access for equal need, but at the cost of vertical equity – unequal access for unequal need. The implication is that if children from wealthy families, or people who are pregnant can afford their dental care then the resource allocated to these patients can, and should, be used to fund care for people who cannot afford their dental care. This point of view offers a contrast to that provided by Asthana and Gibson (2020), who argue that resource allocation in this manner is ineffective and departs – unfairly – away from the NHS founding principals of universal healthcare, but resonates with Roberts, Hsiao and Reich (2015) who criticize the WHO coverage cube as oversimplifying complex considerations of who should be able to access what, which is often tiered.

It should be noted that the previous paragraph considers access in only one dimension: affordability of care. As touched on in Chapter 2, accessibility does include affordability but there are other barriers to accessing care such as dental anxiety, an ongoing dentist-patient relationship, travel and the opportunity cost of time (Freeman *et al.*, 2011; Van Doorslaer and Wagstaff, 1992). Recent reporting indicates that NHS services are more difficult to access for the worst-off in society despite the existing payment exemptions which highlights the difference which can arise between the provision and utilisation of healthcare services which are often talked about under the umbrella of ‘access’ (Harris, 2013; Healthwatch, 2023). That is, although NHS dental services are theoretically available to all, and exclusions to payment exist to aid affordability, (i.e. there is unequal access) the gap between affordability and utilisation of care suggests that there are other barriers hindering

use of dental services for low-income individuals. What is less clear from the data presented in this chapter is the extent to which participants believe equality of access should be pursued outside of affordability of care. Participants raised concerns regarding value for money, and the eventuality that some of the priorities which are desirable in terms of a societal agenda may involve an opportunity cost which is too high. This links more closely with the argument presented by Asthana and Gibson (2020) who state that resource allocation of healthcare based on socioeconomic status can be ineffective due to limited capacity to benefit – i.e. they have high need, but may require infinite healthcare resource to address it, and it is therefore important to consider *health* equity as opposed to health*care*. It is therefore necessary to identify the relative importance of inequality and efficiency.

Two participants raised the idea of equity in terms of need, both highlighting that high needs often translates into high-cost care. They argued differently in terms of where this cost should be burdened, with Chloe arguing that high-cost patients unfairly burden NHS dental care and therefore should contribute more, whilst Simon notes that high-needs people require more treatment and should not have to pay more. Again, Simon highlights the importance of vertical equity but instead relates their argument to need, instead of affordability of care, whilst Chloe introduces the idea of individual responsibility into cost-sharing. Other participants spoke about costs and cost-sharing being required to avoid moral hazard specifically that if all oral healthcare were free, or significantly subsidised, there would be over-use and people may not be incentivised to look after their oral health in the same way as if they were responsible for paying for expensive, remedial dental treatments. Another participant reflected that oral health is a consequence of choice and willingness to prioritise and invest, i.e. that it is individually determined and consequently each individual is directly responsible for their oral health status. Whilst academically it is acknowledged that individual responsibility is only one determinant of oral health, and it is a result of a wider complex system of factors including (but not limited to) socioeconomic status, environmental and political factors it is important to acknowledge that this is an opinion which exists within society – and has been identified previously as an influential factor in NHS priority setting (Fleming *et al.*, 2022; Wang, Mathur and Schmidt, 2020; Watt, 2007).

An issue worth noting in relation to equity and need is that inequalities do not exist only along socioeconomic lines. Inequalities in oral health are also present according

to race, but this is not something which was focused on by our sample. Race and culture was discussed in the context of making sure services are accessible – i.e. to ensure that there are translators or interpreters when necessary, and to ensure the patient is able to receive care from their practitioner. This may be a reflection of the sample themselves, who are predominantly white and therefore may be better equipped to discuss inequalities associated with socioeconomic status than race, or it may be a result of the topic guide which focused on those in society with the worst oral health – which does not necessarily mean the poorest but may have been interpreted as so. The exemptions associated with the NHS co-payment system and the associated discussion around this may have also anchored the notion of inequalities associated with socioeconomic status for participants.

An interesting tension arises in terms of what the participants presented as an acceptable divide between the private and public oral healthcare marketplace, i.e. what is acceptable to be commoditised in relation to oral health. Whilst some participants felt the difference in quality of material was acceptable, other aspects of quality such as time and communication were expected to be similar across services. However, the data presented also demonstrates a gap between those who use private dental care and those who have recent experience of NHS dentistry. Whilst NHS users Charlie and Stephanie both recount their lived experience of unsatisfactory dental care, Stephen and Peter discussed NHS dental care in terms of being ‘good enough’ from their external point of view as private dentistry users. This demonstrates a gap between the service offered, and the care that is delivered. It is not obvious that Stephen and Peter’s perception of NHS dentistry is therefore a reflection of the reality of the situation and therefore their stance of ‘good enough’ only relates to the NHS dental offer, not the available care. This highlights how having a diverse sample with a range of perspectives is important for decision-making.

The priorities for NHS dentistry in this data were identified as: inequality reduction, access, prevention and stabilising the workforce. Previous research also identified that in the context of NHS dental services prevention should be prioritised, with cosmetic dental being the lowest priority (Fleming *et al.*, 2022). Whilst this largely corresponds to the findings presented here, there are other results which offer a contrast. The participants in Fleming *et al.,* (2022) endorsed blanket policies surrounding exemptions for children, something which was raised by this sample as

potentially inequitable. There are two issues to note in terms of the comparability of this study, and the data presented here. Firstly, in terms of the methods the findings discussed here are the result of a questionnaire which included a ranking exercise and therefore may not explore the same nuance afforded in this qualitative study. Secondly it is important to consider how the timing of the data collection may have potentially impacted results. The research published by Fleming *et al.,* (2022) includes data collected in 2018, three years and one global pandemic prior to this study. A later paragraph will address issues regarding the timing of data collection and the subsequent impact on analysis.

Other, more recently published research regarding the prioritisation of NHS services, provides a more timely insight into attitudes held by the British public regarding the NHS. The most frequently picked priorities were relating to the accessibility of services, including the timeliness of access, and improving the workforce, both of which are cited here as priorities for dentistry[7] (Jefferies *et al.*, 2024). One contrast however is that improving the health of the most disadvantaged – i.e. inequality reduction – receives less support. This echoes data collected in 2022 which again prioritised reducing wait times and stabilising the workforce, but gave less weight to inequality reduction achieved through equality of access (Buzelli *et al.*, 2022). Both of these studies gave participants a limited number of choices to pick from a large list of potential priorities for the NHS, which highlights the importance of choice and decision making under constraints. Whilst the analysis here identified four priorities, it is unlikely the strength of preference is equal among these. It is worthwhile investigating if the values for the wider healthcare system are the same for NHS dentistry, or if there is a difference in public priorities between general and oral health.

An interesting point to note is the lack of radical changes suggested. Whilst changes were proposed to the NHS co-payment system and adjustments to the coverage, the focus of participants was predominantly on how we can make the *existing* oral healthcare system work. The discussion did not focus on rebuilding an oral healthcare system from first principals or fundamental reform. This could be a reflection that the existing oral healthcare system is acceptable, and the values are

[7] Out of a sample of 1,206 who were asked about the most important priorities for the NHS (and could select three options), 52% of the sample picked the statement ‘making it easier to get a GP appointment’; 51% picked ‘increasing the number of staff in the NHS’ and 47% picked ‘improving waiting times for planned operations’

reflective of what participants believe the NHS should achieve, provided it can function as has been found in previous research (Buzelli *et al.*, 2022).

The involvement of the public in the decision-making process is something which was discussed by this sample in the decision-making ecosystem theme. Whilst some are strong proponents of Patient and Public Involvement and Engagement (PPIE), others are cautious about the ability of the public to make informed decisions. Previous studies have highlighted the importance of public opinion to provide input beyond the technical specifications – in this case the clinical considerations – as healthcare decisions also include ethical and moral issues which require public input (McKie *et al.*, 2008). It is therefore interesting that participants discussed the potential downfalls of PPIE, particularly as the recruitment mechanism means this sample have been exposed to health-related research, and may have been involved in PPIE previously, and may therefore feel strongly about their ability to contribute and the worthiness of their contributions. It may be that trust in the public opinion has degraded over time, meaning participants are cautious of public input.

The sample met the purposive criteria by including variation in terms of age, gender, ethnicity, IMD (where available), payment for dental care and geographical location. Whilst successful in meeting the outlined sampling criteria, a potential limitation is that these participants were mostly recruited from two online platforms: NIHR People In Research and VOICE. Both sites used are forums for health-related research and consequently it is likely that the participants are more aware of issues facing the healthcare sector and may have a more developed point of view than someone picked at random from the general public. Previous research considering the diversity and representativeness of Patient and Public Involvement groups (PPI) identifies that people involved in health-related research are likely to be under-represented in some respects when compared to the general population, with groups from lower-socioeconomic backgrounds, ethnic minorities and those with lower literacy typically under-represented (Reynolds, Ogden and Beresford, 2021). Other authors identify that time and cost constraints are barriers to involvement in health-related research (Eccles *et al.*, 2018). The study outlined minimised the time and cost commitment by hosting the sessions online at a time suitable for the participants, this also created barrier in that involvement required a degree of computer literacy. Approaching the general public in an in-person setting may have produced a sample who are less familiar with health-related research. However, in-person recruitment was unsuitable

at this point in time (due to the progression of the coronavirus pandemic and the associated vaccine rollout) but could have helped diversify the expertise of the participants. Attempts were made to reach people who were less engaged in health-related research using forums such as Reddit and X however these were mostly unsuccessful. Reflecting on the data itself however a diversity of opinions were expressed and have been documented in this chapter. The breadth and depth of the data itself is therefore likely to capture a wide array of thoughts and opinions of the general public, although it may not capture the full spectrum. A key difference is therefore likely to be how much thought they will have given these issues prior to the interview, the terminology used, and confidence in communicating their points of view.

Regarding the timeline associated with this research, data was collected in Summer 2021. Since then, there has been a cost-of-living crisis in England, and there has been increased news coverage of the issues facing accessibility of NHS dental services. These are significant events which may impact thoughts and opinions regarding NHS dentistry but are unfortunately not reflected in this data. Furthermore, the period in which the data was being collected was during the roll-out of vaccinations to the general public, and it is possible that this was a grace period in terms of public attitudes to the NHS dentistry as services were beginning their 'return to normal', and it was not readily apparent that there would be longstanding issues with public oral healthcare, i.e. a 'new normal', which is what is being experienced now.

5.6 Chapter summary

To summarise, there is a paucity of literature in regard to what the general public believe should be prioritised in relation to NHS dentistry. This study offers a significant contribution in relation to what members of the public believe the NHS should be funding, and to who, and their opinions regarding equity in dental care. This allows for a valuable avenue for the public to be involved with the decision-making process, instead of decisions being made on their behalf or in their best interests. The findings here suggest that NHS dentistry should improve the accessibility of oral healthcare through ensuring affordability of care for those with low incomes, however there is a less coherent conclusion about what should be available to those using and depending on NHS dentistry. Whilst inequalities in health and function were considered unacceptable to all, variation in appearance and

quality were acceptable to some. Further research should be conducted into the intensity of preference, and prioritisation given economic constraints.

Chapter 6: Eliciting public preferences for efficiency-inequality trade-offs in oral health

6.1 Introduction

Whilst previous chapters have engaged in a qualitative exploration of the oral healthcare system, including what a nationally-funded oral healthcare should provide, to who, and the barriers to achieving that, this chapter uses quantitative methods to assess how members of the public are willing to trade when faced with a choice between inequality and efficiency. The following chapter starts with justifying the need for an efficiency-equity exercise in oral health, before discussing the literature and methods used for similar trade-off exercises in health before applying the framework to oral health. The survey design is then described and the results are presented before presenting the results and discussing the strengths, weaknesses, and implications.

Often, publicly funded healthcare systems have multiple objectives. These can include maximising population health and reducing health inequalities – two objectives for NHS dentistry that were discussed as a priority in the previous qualitative chapter (Williams, 2005). *How* to prioritise the objectives of a national healthcare system is a quintessential economic problem of optimisation under constraints, where health and equity are among concerns. Identifying what should be prioritised – and the relative importance of each objective – is therefore paramount to building a healthcare system which operates at its optimum and will be the focus for this chapter.

The question of what, and to what extent, objectives of a healthcare system should be prioritised – i.e. what values the healthcare system should reflect – has been explored in general healthcare. The question is no less relevant, yet so far unexplored quantitatively, in dental care. Some will argue that dental health is part of general health, a movement which is reflected through organisations such as the World Health Assembly who issued a resolution to integrate oral disease into their programme of prevention for chronic conditions in 2007, meaning that addressing inequality and efficiency concerns in relation to a general healthcare system dentistry is implicitly included (Petersen, 2008). Whilst this may be true, in Western countries it is often also true that general primary care and dental care are distinct services, with different financing and funding, operating within their own premises, under different contractual obligations, with a different provider-patient interface, and, as yet to be explored, they should potentially reflect a different set of social values (Sinclair, Eaton and Widström, 2019). Furthermore, inequality-efficiency trade-offs which have

occurred in the sphere of health economics have mostly considered life expectancy, with only a few considering quality of life, which is more relevant to the sphere of oral health (excluding potentially fatal conditions such as oral cancers) (Cadham and Prosser, 2023).

Oral health inequalities are a prominent issue worldwide, and whilst they can be addressed, it is often costly. Addressing oral health inequalities within a constrained oral healthcare system therefore often involves an opportunity cost. Specifically, the efficient option would be to maximise population oral health by offering a small oral health gain to a lot of people who already have good oral health, or the resources could be used to offer oral health improvements to a smaller group of people who start off in worse oral health and reduce oral health inequalities. Inequalities in oral health can be observed in England, with clinical epidemiology, self-reported bad oral health and oral health impacts higher amongst low income groups and other oral health related inequalities along gender and ethnicity divides (Delgado-Angulo, Mangal and Bernabé, 2019; Guarnizo-Herreño *et al.*, 2014; Shen, Wildman and Steele, 2013). Similarly, Public Health England (PHE) have also reported on the prevalence of oral health inequalities, and the importance of addressing them (Public Health England, 2021). Yet simultaneously the attrition of dental professionals has contributed to a crisis in the accessibility of NHS dental services for the general population (Health Social Care Committee, 2023). Whilst oral health inequalities and accessibility of dental services are, at their core, interlinked issues, this still demonstrates an underlying tension: should resources be allocated to those with the worst oral health, or should the focus be on accessibility for all?

This also raises a question of who should provide input into decisions regarding the role and scope of oral healthcare services. As can be seen in the previous qualitative chapter, some members of the public strongly advocate for their role in the priority setting process, whilst others are wary of their ability to provide valuable input into the decision-making process. When considering fundamental questions regarding the core values a national healthcare system should reflect, when the healthcare system itself is financed by tax paid by the general population, and available for use to those same people, and often paid for at point of use, it should ultimately reflect the beliefs and opinions of those who fund, and use, the care available.

The public opinion is therefore critical to consider when deciding the intentions of a nationally-funded oral healthcare system, particularly in a context such as England

where oral health inequalities are prevalent, as an oral healthcare system which provides a more equitable outcome (in terms of inequality reduction) likely does so at the cost of efficiency (maximising population oral health). Furthermore, given the increased interest in using distributional cost-effectiveness analysis (DCEA) in economic evaluations to formally incorporate equity weights from the public into decision making, deriving an inequality aversion parameter for use in oral health begins to build the necessary tools for using DCEA in oral health. Again, this is particularly relevant in context. Oral health inequalities are well documented globally and present a persistent public health issue (Petersen, 2008). Current research priorities are shifting from documenting their existence towards how to address them, and an inequality aversion parameter will provide the public perspective on how much weight should be given to inequality considerations when resources could be used elsewhere (Peres *et al.*, 2019; World Health Organisation, 2022). Locally, the information regarding the prioritisation of inequalities versus efficiency will be valuable in ongoing dental contract reform and can help inform budget allocation, and the extent to which the dental profession should be incentivised to directly address existing oral health inequalities.

Eliciting public preferences regarding the prioritisation of reducing inequalities in a trade-off with efficiency in oral health has, to the best knowledge of the author, not been done. Given the wider context of dental contract reform, and as explored in the qualitative chapters 4 and 5, a wider reckoning of aligning desires for publicly funded oral healthcare systems within the constraints of limited financing, it is important to address the question of if, and how much, inequality reduction is prioritised given the opportunity cost. Since an exercise like this has not been conducted in oral health before, the following chapter will lay out what is known from health economics, then explain how the method is applied to oral health. Some methodological issues will also be raised, and evidence provided, as part of this chapter since issues relating to potential bias cannot be ignored. There will be a more extensive exploration of methodological issues as related to potential starting point bias in the subsequent chapter.

The overarching aim of this chapter is to identify if, and the extent to which, inequality aversion exists in the general public in England, in order to assess this there are several objectives:

1) Assess if inequality aversion exists in oral health for members of the public in England
    a. Identify how preferences from the public correlate to different distributional judgement arguments
    b. Derive an inequality aversion parameter
    c. Establish a marginal rate of social substitution (MRSS) for oral health of the poorest in society relative to the richest

6.1.1 Chapter structure

The following chapter is structured to introduce the fundamental economic theory first (in section 6.2.1) and then presents the methods used to elicit preferences for inequality-efficiency trade-offs in section 6.2.3. The literature regarding these trade-offs as they have been conducted to date in health economics is then presented in section 6.3. The next section, 6.4, establishes how a similar exercise can be conducted in relation to oral health and section 6.5 places the preference elicitation exercise in the context of a wider survey. Section 6.6 presents the results of the questionnaire, and section 6.7 provides a discussion of the results.

6.2 Background

The following section provides background to how the issue of inequality-efficiency trade-offs have been researched in health economics. It is worth acknowledging that there is a wider body of literature regarding income inequality and efficiency, but for the purpose of this thesis the focus is predominantly on health (Browning and Johnson, 1984; Okun, 2015). The main purpose of this section is to introduce the theoretical framework which underpins many studies regarding inequality aversion in health: social welfare functions (SWF).

6.2.1 Social Welfare Functions: a brief introduction

Based in traditional welfare economics, a social welfare function is a representation of the different potential allocations of a resource and their associated consequence in terms of welfare, often represented by utilities. In their simplest form, social welfare functions rank all potential states in society according to the preference ordering of that population (Cowell, 2011). For an inequality-efficiency trade-off, the SWF includes parameters which reflect preferences for both the total amount of health available to a society, and the corresponding distributions. In the context of health economics, the SWF is defined in terms of health, as opposed to utilities, under the argument that health is a direct source of social welfare (Mæstad and Norheim,

2012). The adapted form is referred to as a health-related social welfare function (HRSWF) (Dolan, 1998).

Since social welfare functions originate from welfare economics, they are underpinned by a series of normative assumptions regarding the evaluation of different welfare allocations (Mæstad and Norheim, 2012). These are briefly explained below.

- Individualism: social welfare depends on the health of all in the defined community
- Comparability: you can determine a rank ordering of individuals in terms of their health (cardinally rank)
- Additivity: social welfare is determined on the summation of individual health
- Anonymity: health can be exchanged between individuals and social welfare remains constant
- Strict concavity: egalitarian distributions of health are strictly preferred to less egalitarian distributions
- Homotheticity: graphically, any ray through the origin will cut through all health related indifference curves where the slope (and marginal rate of substitution) is the same
- Monotonicity (can be strong or weak): any increase in the health of an individual will increase social welfare (strong: if health increases, social welfare increases; weak: if health of one individual increases, societal welfare does not decrease).

As the application to health is a departure from traditional utilities which welfare economics is based on, the above reflects the assumptions as they relate to HRSWFs, some of which have been amended from traditional SWFs. One example is the comparability assumption, which needs cardinal measurability in order to present health on an individual scale and thus enabling trade-offs (Abásolo and Tsuchiya, 2004). Whether or not the assumptions listed hold in relation to HRSWF, particularly with respect to anonymity and monotonicity, will be explored in the literature review section of this chapter.

6.2.2 HRSWF: functional form(s)

There are several different functional forms of HRSWF which have been proposed. Abásolo & Tsuchiya (2004) offer a list of eight different specifications and how they

correspond to the assumptions outlined in the previous section. Some of these are overly prescriptive for the purpose of this inequality-efficiency trade off, for example additive SWFs which only take into account the total health of the population, not the distribution, or the Rawlsian form which only accounts for the health of the worst-off in society. This section will focus on the constant-elasticity of substitution health-related social welfare function (CES HRSWF) developed by Wagstaff (1991) as this functional form can account for non-health related preferences between groups and inequality aversion (Abásolo and Tsuchiya, 2004; Cadham and Prosser, 2023). This is important in the context of oral health inequalities because of the relationship between oral health and socioeconomic status, meaning it may be necessary to control for non-health related preferences which would otherwise impact inequality aversion. The importance of this will be reflected on in a later part of this chapter. The CES HRSWF is expressed as:

$$W = \left[\alpha U_J^{-r} + (1-\alpha) U_K^{-r}\right]^{-\frac{1}{r}} \text{ (eq. 1)}$$

Where:

- W is the level of social welfare,
- U_J and U_K are the total level of individual wellbeing (u) of groups J and K (given U is the sum of u),
- α is the weight given to one group relative to another and
- r is the inequality aversion parameter.

Assuming anonymity holds, the weighting to groups U_J and U_K are equal and therefore $\alpha = (\alpha - 1) = 0.5$. This means r, the inequality aversion parameter only captures preferences related to the inequality itself.

An important property of the CES specification, as opposed to the Atkinson Equally Distributed Equivalent, or Kolm index, is that inequality aversion is expressed terms of the inequality aversion itself (r), and allows for a weight for the groups, (α). Other forms of HRSWF do not account for potential weighting between groups due to non-health related preferences because of the anonymity assumption.

In order to utilise the CES HRSWF in the context of inequality and efficiency, two points on the same contour must be known – i.e., two states of oral health deemed to be equally good in terms of social welfare. This is represented by an iso-welfare curve. Figure 6.1 demonstrates an iso-welfare curve in a scenario where two

hypothetical programmes (A and B) are offered, with the line going through the two points deemed to be equivalent in terms of social welfare, using years of functioning dentition as the measure of oral health (but could also be a measure of something else, such as life expectancy):

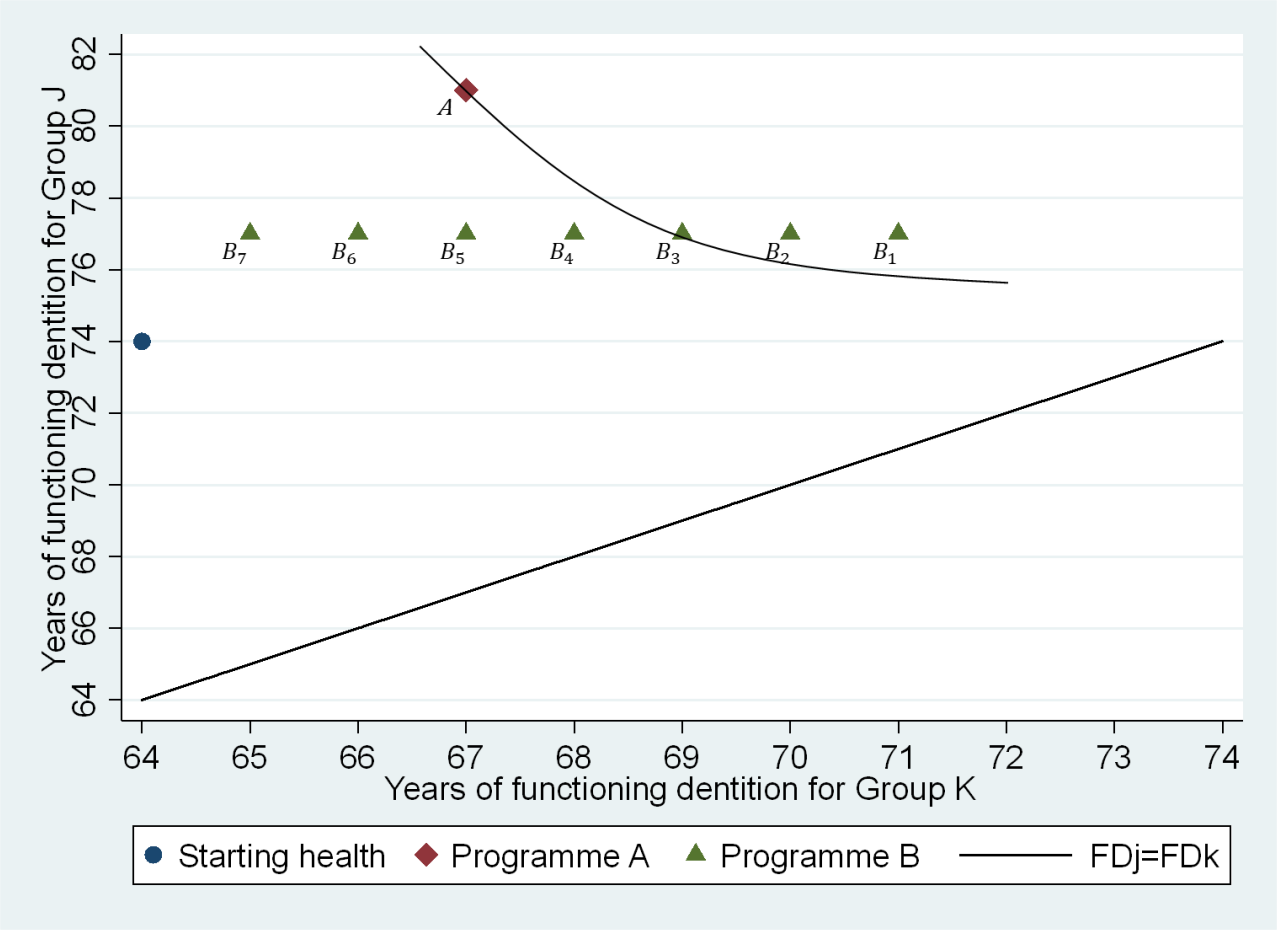

Figure 6.1: iso-welfare plane example

The line going through the origin is at 45 degrees at $FD_j = FD_k$, represents where the years of functioning dentition between the two groups are equal. The starting point outlines a scenario where Group J starts off with 74 years functioning dentition, and Group K starts with 64 years of functioning dentition. Point A represents the oral health gain offered in the hypothetical Programme A, which in this example is 81 years of functioning dentition to Group J and 67 years of functioning dentition to Group K. Points $B_1 - B_7$ show the different distributions of years of functioning dentition offered in Programme B. The iso-welfare curve is formed where there is equivalence between two points, i.e. the Programme B option which is deemed to be equally good as Programme A, which in this example is B_3 which gives 77 years of functioning dentition to Group J, and 69 years of functioning dentition to Group K.

However, until it is known which Programme B option is thought of as equally good as the fixed point presented in Programme A, the parameters as defined by eq.1 are unknown. If the indifference point is identified, as in Figure 6.1 a Marginal Rate of Social Substitution (MRSS) can be calculated between the two groups. This is expressed as follows:

$$MRSS_{JK}\,\frac{\alpha}{(1-\alpha)}\left[\frac{((U_K(A)+U_K(B))/2}{((U_J(A)+U_J(B)/2}\right]^{(1+r)} \quad \text{(eq.2)}$$

Where $U_K(A)$ and $U_J(A)$ represents the years of functioning dentition to the worse-off group and the better off group in Programme A respectively, and $U_K(B)$ and $U_J(B)$ represents the years of functioning dentition for both groups in Programme B. The derivation process for this is based on Dolan and Tsuchiya (2009) and can be found in the appendix, item H. Again, if the point of indifference between the two programmes is known the equation can be rearranged to solve for r by taking the log to give a unique value:

$$r \;\approx\; \frac{log\left[\frac{\left(U_K(A)-U_K(B)\right)}{\left(U_J(B)-U_J(A)\right)}\right]-log\left[\frac{\alpha}{(1-\alpha)}\right]}{log\left[\frac{\left(U_K(A)+U_K(B)\right)}{\left(U_J(A)+U_J(B)\right)}\right]}-1 \quad \text{(eq.3)}$$

The value of r is therefore expressed as a function of α and can be solved under the assumption of anonymity ($\alpha = 0.5$) to give the inequality aversion parameter. This determines the curvature of the iso-welfare function.

Given that any functional form of HRSWF depends on identifying two points on an iso-welfare curve where societal welfare is thought to be equal, it is important to address the different preference elicitation mechanisms which can be used.

6.2.3 Identifying the indifference point

The following section describes two methods which are commonly used in the health economics literature to elicit indifference in inequality-efficiency trade-offs, the Person Trade-Off (PTO) and the Benefit Trade-Off (BTO)[8]. Although others exist, these are the methods most commonly used in inequality-efficiency trade-offs in health (Cadham and Prosser, 2023).

[8] Other preference elicitation methods have been used to elicit indifference, but these are often bespoke exercises intended to reflect parameters specific to the research questions, as in: Attema *et al.,* (2015), Hurley, Mentzakis, and Walli-Attaei, (2020) and Plans-Rubó (2004).

Pairwise Person Trade-Off (PTO)

Nord (1992, 1995) initially suggested the use of a pairwise Person-Trade Off (PTO) to measure social value of different health care interventions in the context of utility measurement for Quality-Adjusted Life Years (QALY) generation. Typically, in this context a PTO seeks to establish an equivalence ratio between two distinct groups of people experiencing a health inequality. The PTO will present participants with two groups of people, with the number contained in each defined, and describe the nature of the inequality. For example, a recent study used an inequality in relation to life expectancy for the poorest and richest fifth in society in England (McNamara, Tsuchiya and Holmes, 2021). Participants are presented with pairs of hypothetical interventions, each of which benefit only one of the described groups, and are asked to make a choice between which intervention they would prefer to be realised. The number of participants in the groups are then varied systematically until indifference (meaning the participant is equally happy between the two points) is reached. An example of this is presented in Table 6.1:

	Option A	Option B
Number of people to benefit	100	100
Socioeconomic status	Poorest fifth	Richest fifth
Change in life expectancy	Increases by 7 years	Increases by 7 years
Change in inequality	Increases by 4 years	Decreases by 4 years
I am equally happy with both options	I prefer option A	I prefer option B

Table 6.1: Person Trade-Off example

Depending on survey design, the initial choice of the respondent may be made less attractive, or the other choice may be made more attractive. For example, if the participant picks Option A as their preferred choice, the exercise may decrease the number of people to benefit in Option A or increase the number of people to benefit in Option B, until they are indifferent between the two. Nord (1995) however warns that this method needs careful implementation to be successful in eliciting preferences, as the framing of the scenarios may introduce bias and an insufficient sample size will mean the random measurement error is unacceptable.

The use of the PTO in the context of social preferences regarding the distribution of health gains or healthcare resources gained some criticism from wider sources too. Dolan identified four potential confounding factors which participants may implicitly weigh in their elicited answers: firstly, the severity of pre-intervention health-state, secondly the post-intervention health state, thirdly the health gain as a result of intervening, and finally the number of persons treated (Dolan, 1998). That these factor into a participant's response is not problematic insofar of itself, but if they are not acknowledged and controlled for it can be difficult to isolate what is driving the response means making conclusions regarding a participant's (lack of) inequality aversion is impossible. The criticisms outlined led to the development and use of the Benefit Trade-Off in health which subsequently has been commonly used to elicit preferences for health distributions (Dolan, 1998).

Benefit Trade-Off (BTO)

Sometimes identified as a bespoke trade off by the wider literature, a Benefit Trade-Off (BTO) presents participants with two groups in society where there is a health differential (for example, the difference in life expectancy between the richest fifth and poorest fifth as in Robson *et al.*, (2017)) and highlights the inequality between the two (Gu *et al.*, 2015). Respondents are then presented with two hypothetical health interventions, typically named Programme A and Programme B. The programmes are outlined to affect the health of the two groups and detail what they offer to each group in terms of health gain, the total health gain, and the impact this has on inequalities, this is known as a scenario. A hypothetical example of a scenario is presented in Table 6.2 using years of functioning dentition as the measure of inequality and socioeconomic status to describe the two groups.

	Programme A			Programme B		
	Years of functioning dentition			Years of functioning dentition		
	Before the programme	After the programme	Gain	Before the programme	After the programme	Gain
Poorest fifth	64 years	67 years	3 years	64 years	71 years	7 years
Richest fifth	74 years	81 years	7 years	74 years	77 years	3 years
Total health gain	10 years			10 years		
Inequality	Increases by 4 years			Decreases by 4 years		

Table 6.2: Example of a scenario in a benefit trade-off exercise

In the scenario provided in Table 6.2, both programmes offer the same total health gain but Programme A will exacerbate inequalities whilst Programme B will decrease inequalities. Participants are asked to pick between scenarios, or state indifference. If the option which offers inequality reduction is chosen, efficiency will decrease in an appropriate increment (for example, a reduction of 1 year in functioning dentition) and continue to decrease incrementally until indifference is reached, or all the potential health gain is exhausted. Programme A remains fixed, and is therefore typically termed the efficient option as it will always provide a health gain which is the same as, or more than, Programme B, which is known as the inequality reduction option as the impact on inequalities will always be lesser than that in the efficiency options.

Similarly to PTO, authors warn against potential sources of bias relating to the framing of this exercise (Abásolo and Tsuchiya, 2013; Ali *et al.*, 2017). However, a benefit of this method is that responses can be categorised in terms of different distributional judgement values, as outlined by Robson *et al.,* (2017). These will be explained in more detail in the next section.

6.2.4 Applications of the indifference point: analytical outputs

Previous sections have outlined that a Marginal Rate of Social Substitution (or MRSS, which identifies the relative importance of one group relative to another) can be derived from a PTO or BTO exercise. Another output that can be derived from a BTO, which has yet to be described in detail, is the categorisation of participants into difference distributional judgements. Robson *et al.,* (2017) outlines five different

classifications – known as distributional judgements – which relate to when a participant is indifferent between programmes, switches between programmes, meaning they go from preferring Programme B to Programme A, or becomes indifferent between the programmes. The distributional judgements are as follows:

- **Pro-rich.** These participants when presented with the most efficient option (meaning total health gain between the two programmes is the same) will pick the option which gives the larger health gain to the better off group, i.e. they want to give to the better-off.
- **Health maximisers.** Participants who are considered health maximisers seek to maximise the total health gain regardless of who receives the health benefit.
- **Weighted Prioritarians.** These participants take into account both the health gain and the impact on inequalities. They care for both efficiency and inequality reduction.
- **Maximin.** A maximin response is one which focuses only on the health of the worst-off group and will pick the option which maximises health for this group. This group is also sometimes referred to as Rawlsian.
- **Egalitarians.** The egalitarian participants will pick the option which minimises the inequality, even at the cost of a potential health gain. This is also a non-monotonic preference, as there is a smaller difference between the groups but all parties receive less (Attema *et al.*, 2015).

These indifference points can be represented diagrammatically as can be seen in Figure 6.2. Continuing the previous example from the BTO section, where two programmes outline a potential health gain of 10 years with different distributions, and decreasing efficiency in Programme B:

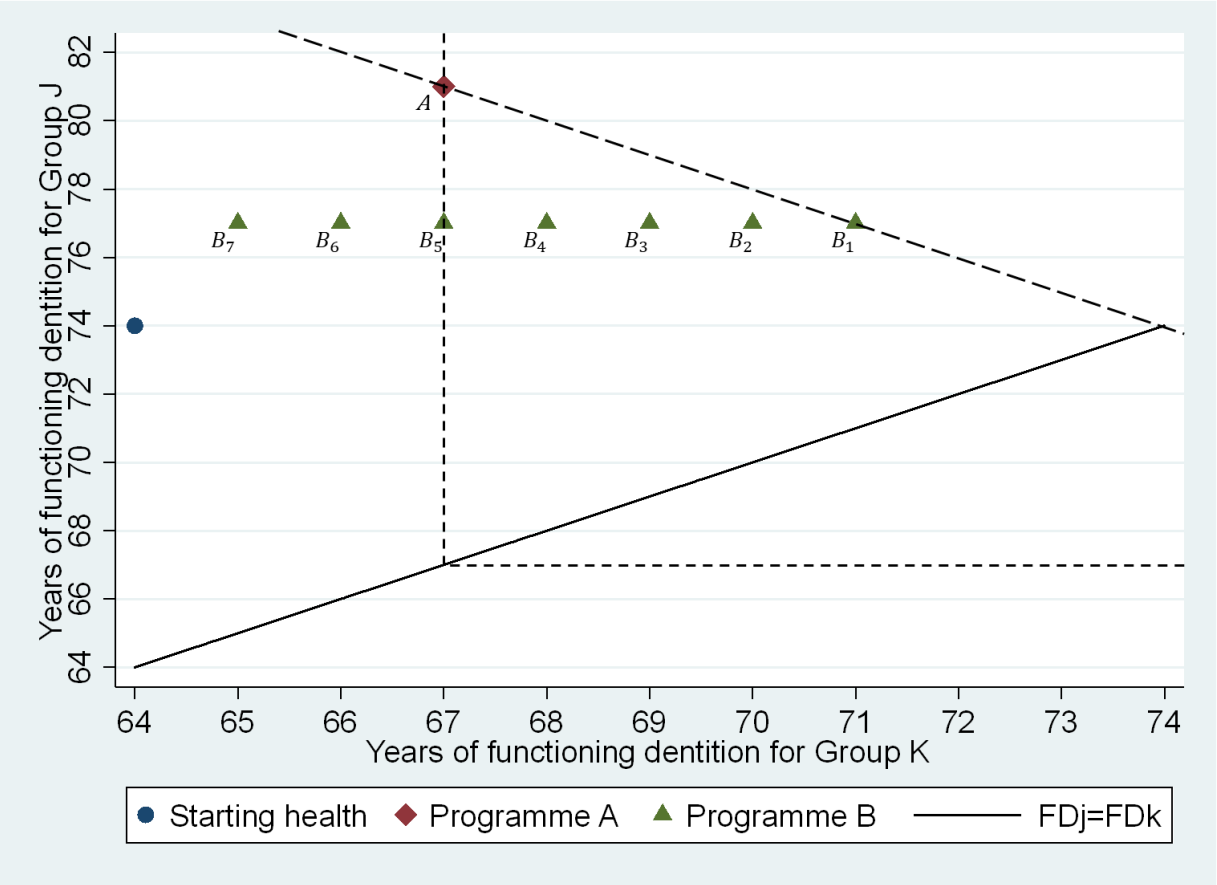

Figure 6.2: Programme options on the iso-welfare plane

The dashed axis passing through B_5 represents the maximin option, where only the health of the worse-off group (Group K) is important whilst the dashed line going through point A and B_1 is that of a health maximiser: only the total health gain matters. The points $B_2 - B_4$ represent a weighted prioritarian, i.e. there is accounting for both the inequality reduction and the total health gain, whilst points B_6 and B_7 represent egalitarians – they are willing to sacrifice the gain in functioning dentition offered by Programme A in order to pick the option which reduces inequalities.

The inequality aversion parameter can be derived once the indifference point has been defined, allowing for the calculation of the MRSS. Again, continuing the example from the HRSWF section using eq. 1 where the better-off (Group J) have a starting point of 74 years functioning dentition and the worst-off (Group K) have a starting point of 64 years functioning dentition the associated inequality aversion parameters and distributional judgements are provided in Table 6.3:

Values of indifference point in years of functioning dentition				Distributional judgement	Inequality aversion
Programme A		Programme B			
Better-off $U_J(A)$	Worse-off $U_K(A)$	Better-off $U_J(B)$	Worse-off $U_K(B)$		r
81	67	77	71	Health maximiser	-1
81	67	77	70	Weighted prioritarian	1.02
81	67	77	69		3.62
81	67	77	68		7.81
81	67	77	67	Maximin	Undefined (divided by 0)
81	67	77	66	Egalitarian	Undefined
81	67	77	65		Undefined

Table 6.3: Example of indifference points, distributional judgements and inequality aversion parameters

As can be seen here, when preferences are egalitarian there is not an associated inequality aversion parameter. This occurs when preferences are non-monotonic, i.e. participants accept a health gain which offers a lower health gain to both groups as a result of inequality aversion (with exception of the maximin case, which provides an equal health gain to the worse-off group but a lower health gain to the better-off group relative to Programme A). For the maximin case therefore the denominator for the derivation process outlined in section 6.2.2, and for egalitarian is negative, and these cannot be transformed logarithmically. These low values represent extreme inequality aversion, and their interpretation is that the inequality parameter is larger than infinity (Abásolo and Tsuchiya, 2004). This issue is revisited in the next Chapter.

6.3 Literature Review: efficiency-inequality trade-offs in health

The following literature review is split into four sections. The first three sections address the literature regarding the measures of inequality and results found whilst the final section provides a commentary regarding the issue of anonymity and introduces two proposed solutions.

The studies discussed in the literature review were identified by searching relevant terms (such as ‘inequality aversion health’ and ‘health-related social welfare functions’) in an academic search engine. After relevant papers were identified, the

papers which they referenced were screened for relevance and papers which had, in turn referenced the identified papers were screened. One paper identified using this strategy was a scoping review regarding equity and efficiency trade-offs (Cadham and Prosser, 2023), whilst the another was a systematic review regarding inequality aversion in health in the UK (McNamara et al., 2020). Alongside the papers independently identified, the inclusion of the scoping review and systematic review meant the author was confident a wide body of relevant literature had been identified given the relatively small field. One more recently published paper which is included here the author was aware of as a result of conference attendance (Robson, O'Donnell and Van Ourti, 2024).

The majority of the studies use a BTO preference elicitation method, with the exception of McNamara, Tsuchiya and Holmes (2021) who use a PTO and Robson, O'Donnell and Van Ourti (2024) who use a bespoke preference elicitation exercise (this is described further in section 6.3.4 as it is proposed as a solution to some of the issues raised by the literature).

6.3.1 Inequality to who?

Studies regarding inequalities in health often frame the inequality in health in terms of socioeconomic status. For example, Robson *et al.,* (2017) frame the inequality as the difference in life expectancy between the richest and poorest fifth of people in England, whilst Abásolo & Tsuchiya (2013) describe higher and lower socioeconomic groups. Other studies have used alternative framings, with Dolan and Tsuchiya (2011) presenting the inequalities according to socioeconomic status, sex, and the 'healthiest' and 'unhealthiest' 20% of the population. McNamara, Tsuchiya and Holmes (2021) and Robson, O'Donnell and Van Ourti (2024) also provide a neutral framing alongside an economic framing in their preference elicitation exercise, identifying the groups as those with Disease A or Disease B in the former and with randomly assigned initials in the latter. Pinho and Botelho (2018) similarly present their exercise using an anonymised format, followed by one which identified groups as highest skilled workers or lowest skilled workers.

One study has examined individual responsibility as the source of the inequality in an inequality-efficiency trade off exercise and derived weightings related to each group (i.e. how much priority should be given to individuals given they are/are not responsible for their health conditions) (Dolan and Tsuchiya, 2009). Dolan & Tsuchiya (2009) present health states that can be placed on a spectrum, ranging

from “*exogenously* determined (i.e. due to ‘bad luck’)” to “*endogenously* determined (e.g. as a result of well-informed ‘own choices’)”, citing examples such as inherited disease as exogenous and diseases resulting from smoking as endogenous.

When faced with the choice, the framing usually asks the participants to make a choice in the context of a governmental decision (or, social decision maker) and they are asked which they think the government/social decision maker should choose to implement however Dolan and Tsuchiya (2011) ask participants to consider only their own perspective (McNamara, Tsuchiya and Holmes, 2021; Robson *et al.*, 2017; Robson, O’Donnell and Van Ourti, 2024).

6.3.2 Inequality of what?

Most studies examining inequality in health have used a difference in life expectancy as their inequality (Cadham and Prosser, 2023; Robson, O’Donnell and Van Ourti, 2024). A notable exception is McNamara, Tsuchiya and Holmes (2021), which utilises a study design to examine (potential) differences in inequality aversion across three different areas of health: life expectancy, pain levels and mobility (being able to walk without difficulty). These measures encapsulate the different domains of the QALY: quantity of life (life expectancy) and quality of life (pain and mobility). The QALY gain offered in each scenario was 3, regardless of whether it was derived from quality or quantity of life improvements.

6.3.3 Findings

Robson *et al.,* (2017) provide several different outputs from their study, including inequality aversion parameters, the categorisation of respondents into the distributional framework (as outlined in section 6.2.4), and a willingness to trade metric. They report an Atkinson inequality aversion index of 10.95 which is similar to the inequality aversion parameter of 12.63 found by McNamara, Tsuchiya and Holmes (2021). Both of these figures are significantly higher than that found by Robson, O’Donnell and Van Ourti (2024) who estimate a parameter of between 3.2 and 3.5 for pure, income-related and income-caused health inequality and Pinho and Botelho who find inequality aversion parameters of between -1 and 4.85.

For the distributional judgements Robson *et al.,* (2017) identify the majority of their respondents as weighted prioritarians (50.98%), with 26.98% egalitarian, 15.58% pro-rich and 2.91% health maximisers. They also note that most of their respondents are willing to trade, with 81.51% trading some health to reduce the health inequality.

Robson, O'Donnell and Van Ourti (2024) find that all of their participants are willing to trade and will willing to sacrifice some health to reduce health inequality. In Robson *et al.,* (2017), 216 responses were excluded from the base case analysis. This was because they provided an invalid response which was defined as: completing the survey too quickly, participants said they were equally satisfied with all options, or they switched their responses more than once during the survey, leaving a sample of 244. Ultimately this means that from a sample of 460, only 53% are used in the base case analysis.

While Robson *et al.,* (2017) find over a quarter of their respondents included in the base case analysis have egalitarian preferences, this number is 50.5% for Abásolo and Tsuchiya (2013). These studies highlight a potential issue with HRSWFs, as egalitarian preferences mean that respondents are willing to accept less health for all groups in the exercise in order to reduce inequalities. This indicates that their preferences are non-monotonic, and therefore violating an underlying assumption in the functional form of HRSWFs. Pinho & Botelho (2018) also find that between 4.9% and 12% of their sample have non-monotonic preferences. This issue will be discussed further in the following Chapter.

In the study by Dolan & Tsuchiya (2009) which presents individuals as responsible (or not) for their health state as they have made an informed choice and decided to smoke, they find those who are presented as responsible for their health status in the smoking scenario are given half as much weight as those who are not presented as responsible for their health status, i.e. the principal of anonymity does not hold for this situation and $\alpha \neq 0.5$. Furthermore, that the majority of respondents are unwilling to prioritise inequality reduction for the group responsible for their own health status. In Pinho and Botelho (2018), they find that inequality aversion is higher when groups are identified by their professional classes, again suggesting that anonymity does not hold.

McNamara, Tsuchiya and Holmes (2021) identified that respondents are more likely to prioritise treatments for groups with lower life expectancy than when the health gain was related to pain or mobility. When asked to justify their choices, respondents often related to statements regarding equity but included a range of horizontal and vertical equity concerns (i.e. some felt that there should be increased prioritisation of those with lower life expectancy because they have a lower life expectancy, but for the pain and mobility questions their lower quality of life starting point was not a

reason for prioritisation and instead all people should be treated the same). This study also asked across two framings: one which positioned groups neutrally in relation to a disease; Disease A or Disease B, and one which positioned groups in relation to their socioeconomic status, the richest fifth or the poorest fifth. Across the three different health outcomes, participants who answered the questions with the groups framed socioeconomically were more willing to prioritise the poorest fifth than those who answered the neutrally framed questions where Disease A had the same life expectancy/pain/mobility profile. Similarly, their justifications for their responses often linked to the socioeconomic status of the groups, with approximately 30% of people justifying their response with the statement *'Poorer people are disadvantaged in many other ways in life'* in each of the life expectancy/pain/mobility scenarios. Their findings indicate that, when differences in health are presented by the socioeconomic status of the groups, non-health rationale can impact the willingness to prioritise the worse-off group. This raises issues regarding the anonymity assumption which underpins the HRSWF.

6.3.4 Methodological concerns

As outlined previously, some of the evidence provided by inequality-efficiency trades-offs contradict the underlying assumptions of HRSWF. This section therefore focuses on the issue of anonymity as raised in the literature, which suggests non-health rationale can, and does, impact inequality aversion.

At the time of writing, there is no gold standard to control for the potential additional impact of non-health preferences when eliciting inequality aversion in health. The method below describes a process proposed by Pinho & Botelho (2018) which can be used in conjunction with the BTO although an alternative method which seeks to identify 'pure' health inequality aversion, income-related health inequality aversion and income-caused health inequality aversion has recently been published (Robson, O'Donnell and Van Ourti, 2024). This will be described briefly.

Basing the inference procedure on the CES HRSWF, Pinho & Botelho (2018) suggest respondents answer two trade-off exercises, where one is framed neutrally and one is framed socioeconomically, *ceteris paribus*. The intuition is as follows: if one scenario is answered in the neutral framing, i.e. the groups are described by only their health status, and another is answered in the socioeconomic framing, where groups are described by their socioeconomic status, the resulting difference (if there is any) can be attributed to non-health related rationale. If this difference is identified

and known, it can be developed into a weighting to account for non-health related rationale in the CES HRSWF.

Section 6.2.2 has already outlined the CES HRSWF in eq.1 which is the basis of this derivation process, and provided the specification to solve for the MRSS the assumption of anonymity ($\alpha = 0.5$). Pinho & Botelho (2018) suggest that by having respondents answer an inequality-efficiency trade off question using a neutral framing anonymity can be assumed to hold and therefore a value of r can be found as it is expressed as a function α, as shown in eq.3.

To estimate the true value of α, meaning one that allows for weightings between the groups for non-health rationale, a second question must be asked which identifies the groups using their socioeconomic status. Using this indifference point $(U_K(B_S))$, in combination with the value of r which was found using the neutral, anonymous scenarios can be used in the following equation, which is then used to solve for α:

$$\left[\alpha(U_K(A))^{-r} + (1-\alpha)(U_J(A))^{-r}\right]^{-\frac{1}{r}} = \left[\alpha(U_K(B_S))^{-r} + (1-\alpha)(U_J(B))^{-r}\right]^{-\frac{1}{r}} \quad \text{(eq.4)}$$

Where $U_K(A)$ and $U_J(A)$ are the fixed health outcomes for groups K and J described in Programme A, $U_J(B)$ is the fixed health outcome for Group J in Programme B and $U_K(B_S)$ is the corresponding trade-off point in Programme B for Group K when groups are defined by their socioeconomic status. This weighting can then be used to calculate the MRSS as outlined in eq.2, using the inequality aversion parameter (r) found in the anonymity scenario and the weights (α) determined by how responses change over the two framings. This means that the r is observed, whilst the α is implied by taking the difference between the two scenarios.

The study outlined by Robson, O'Donnell and Van Ourti (2024) uses a similar format in that they ask their respondents a series of questions in order to distil three types of health-related inequality aversion: pure, income-related and income caused. Through a series of three choice sets participants are first asked anonymised questions regarding their preferences for resource distribution to give 'pure' inequality aversion. The second choice set randomly assigns incomes, where participants preferences will reflect income-related health inequality aversion. The third choice set outlines the causal effect of income on health and therefore elicits preferences for health inequalities where income is causal to the health inequality. The differences between preferences in these choice sets allows for the observation of only health inequality

aversion, followed by inequality aversion when income and health may be related, and finally inequality aversion when income and health are directly linked. The method also differs as instead of offering a binary choice between programmes, participants are asked to allocate a budget between individuals using a sliding scale. This is presented here for completeness but had not been published at the time of study design and data collection (2022).

6.4 Methods

As section 6.3 has outlined, most studies which have conducted an inequality-efficiency study in health have focused on life expectancy, with only a couple of exceptions which have focussed on pain or mobility. This section first outlines the methodology chosen, and why, before describing how the inequality-efficiency exercise will be applied to the context of oral health.

The BTO was chosen for this exercise as it allows for the two-parameter trade-off between inequality and efficiency, but also allows the responses to be identified in terms of different distributional judgements. This was thought to be advantageous from a policy perspective: in practical terms, unless using an evaluation including a weight for distributional cost-effectiveness utilising an inequality aversion parameter in a meaningful way can be difficult. Providing a summary of the prevalence of distributional judgements which exist in the general population may offer a more useful insight into which policies reflect societal preferences at a policy-making level, for example a commissioner of oral health services can meaningfully make decisions about different oral health policies knowing that most of their constituents support sacrificing some resources in terms of efficiency to reduce oral health inequalities (if the sample is weighted prioritarian). As mentioned previously, the method outlined by Robson, O'Donnell and Van Ourti (2024) was not considered as it had not been published at the time of study design.

The BTO also focuses on a core issue within oral health: for existing oral health inequalities, inequality reduction is more resource intensive than oral health improvements at a national level. This means it is less efficient to reduce oral health inequalities compared to providing a small oral health improvement at a national level, or to those who already have good oral health. Reducing inequalities is often competing for resources against a backdrop of improving population health (Williams, 2005).

Finally, since the majority of studies in health economics have also used a BTO, using the same preference elicitation exercise lends greater comparability between the results. As the methodology is more established, with studies such as Ali *et al.,* (2017) already documenting and outlining potential pitfalls of the method this means there is more known about what to control for and how to do it.

As the majority of studies regarding inequality-efficiency in health have focused on life expectancy there needs to be consideration of how to apply the study to oral health. Before describing how the survey was conducted, several important decisions need to be made about how to set up the exercise. These include:

- The measure of oral health to be used to describe the inequality (and, consequently, the inequality to be described)
- Which groups should be used for the framing of the inequality

The following sections will address these points in turn and then moves onto building this information into a BTO exercise.

6.4.1 Inequalities of what in oral health?

Oral health is largely a determinant of quality of life, i.e. the extent to which one can chew, talk, and go about their day to day lives without pain, discomfort or embarrassment with very few oral health conditions linking to decreased life expectancy. It is therefore appropriate to use a quality-of-life measure for this context.

There are many different quality of life measures which exist related to oral health and therefore could be used as the basis for the inequality for the BTO. It was decided that the years of functioning dentition should be used. This is a composite measure and takes the minimum number of teeth required to live day-to-day life normally and the number of years someone has this number of teeth. Although there are several different interpretations regarding what constitutes functioning dentition, including considerations such as occlusion and mandibular stability, for the purpose of this study, this was defined as 20 or more natural teeth. This is based on (Gotfredsen and Walls, 2007; Käyser, 1994; WHO Expert Committee on Recent Advances in Oral Health, 1992). Using this simpler definition minimises the volume of information participants were expected to read and digest. Using this measure was also thought to be an adequate reflection of a minimum standard for oral health discussed in the qualitative data and reflects the current English NHS dental offer

(*"The NHS will provide any clinically necessary treatment needed to keep your mouth, teeth and gums healthy and free of pain."*) (NHS, 2023).

6.4.2 Inequality to who in oral health?

As documented in section 6.3.1 previous research in health has used a variety of ways to define the inequality between groups, including neutral framing, socioeconomic status, sex, and skill associated with the workforce (Abásolo & Tsuchiya, 2013; Dolan & Tsuchiya, 2011; Pinho & Botelho, 2018; Robson *et al.,* 2017, Robson, O'Donnell and Van Ourti 2024). Research in oral health has indicated that socioeconomic status is a key determinant of oral health status (Guarnizo-Herreño et al., 2014; Public Health England, 2021). There is also data available regarding oral health status and socioeconomic status, meaning that using the measure of functioning dentition in relation to socioeconomic status would mean that the exercise would be based on existing inequalities. The data used to base the parameters in the preference elicitation exercise will therefore be based on data regarding the years of functioning dentition in relation to socioeconomic status. However, the literature indicates describing the groups by socioeconomic status will introduce non-health considerations into the trade-off. In order to control this, the method proposed by Pinho & Botelho (2018) is used in this study. This means that participants are asked to complete the trade-off using two different framings, the first which presents the inequality neutrally (using phrases to reflect oral health status, specifically the fifth of society with the best oral health and the fifth of society with the worst oral health) before moving onto a socioeconomic framing (using language to describe socioeconomic status, the richest fifth and the poorest fifth of society). This method allows for both the inequality aversion parameter to be derived, and a weight associated with non-health information to be applied to the groups.

6.4.3 Inequalities in functioning dentition in England

The data regarding the inequality was based on the 2009 Adult Dental Health Survey (ADHS), which was the most up-to-date data at time of designing the BTO. Since the ADHS only presented the data in 10 year intervals, the upper-band for the worse off group and the upper band for the better-off group was used, meaning there is a total difference of 10 years between the two groups. A 10 year interval is comparable to what has been used in previous studies using a BTO for life expectancy.

Examining the data according to the Index of Multiple Deprivation (IMD) Decile and functioning dentition of the dentate population (a sample of 892 people), Table 6.4 below gives the following distribution of IMD Deciles and age:

IMD Decile (England, 2010 IMD) *(where 1 is most deprived and 10 is least)*	Median age
1	55-64
2	55-64
3	55-64
4	55-64
5	65-74
6	65-74
7	65-74
8	65-74
9	65-74
10	65-74

Table 6.4: Age functioning dentition is retained until by Index of Multiple Deprivation for the dentate population

To reflect this data, the starting inequality to be used in the preference elicitation exercise was set at 64 years of functioning dentition for the worse-off group, with the better off group starting off with 74 years functioning dentition. This is the baseline for the preference elicitation exercises. The potential gain in functioning dentition was set at 10 years (total, split between the two groups). This reflects the data in the ADHS, and also mirrors the ranges used in previous studies.

6.4.4 Methods: constructing the BTO

Whilst the last section has outlined what measure of inequality will be used in the BTO, and the data this will be based on, this section outlines how it is used in the scenarios for the preference elicitation exercise and the implications for parameter elicitation.

The Scenarios

To elicit a trade-off, two hypothetical programmes are presented to respondents, Programme A and Programme B. Whilst the total gain in years of functioning dentition for these two programmes are the same in the initial scenario, the distribution is different. Programme A favours the group who start off in better oral

health whilst Programme B favours those who start with worse oral health. An example of the starting scenario, based on the inequality outlined in section 6.4.3, is given in Table 6.5:

	SCENARIO 1					
	Programme A			Programme B		
	Functioning dentition			Functioning dentition		
	Before the programme	After the programme	Gain	Before the programme	After the programme	Gain
People with the **worst** oral health	64 years	67 years	3 years	64 years	71 years	7 years
People with the **best** oral health	74 years	81 years	7 years	74 years	77 years	3 years
Total health gain	10 years			10 years		
Inequality	Increases by 4 years			Decreases by 4 years		

Table 6.5: Starting scenario (Scenario 1) example

To elicit a trade-off, participants are asked to choose between Programme A (which remains fixed throughout the exercise) and Programme B (which can vary). They are also able to state indicate no preference, by stating they are equally happy with the two options. Their choice dictates if they are asked subsequent questions, with no further questions asked if they state a preference for Programme A (as this will remain unchanged) and if they state they are equally happy (as their indifference point has been elicited). Participant were not aware of this – they were told they would be represented with a series of choices but were not given details regarding any of the mechanics. If Programme B is picked, the next choice will decrease the efficiency of Programme B and reduce additional years of functioning dentition to the group with the worst oral health by one, which also decreases the total oral health

gain by one and decreases the inequality reduction by one. This is displayed in Table 6.6:

	SCENARIO 2					
	Programme A			Programme B		
	Functioning dentition			Functioning dentition		
	Before the programme	After the programme	Gain	Before the programme	After the programme	Gain
People with the **worst** oral health	64 years	67 years	3 years	64 years	70 years	6 years
People with the **best** oral health	74 years	81 years	7 years	74 years	77 years	3 years
Total health gain	10 years			9 years		
Inequality	Increases by 4 years			Decreases by 3 years		

Table 6.6: Scenario 2 example

The process, asking participants to state their preferences, and the consequences of their choices, remains the same until participants reach scenario 7. By scenario 7, those with the worst oral health are offered 1 additional year functioning dentition, taking their years of functioning dentition to 65 after the programme, the total health gain to 4 years, and an increase in inequality of two years. There is not a scenario which offers no gain in functioning dentition to the worse off group. A summary of scenarios and the distribution of years functioning dentition for Programme B is shown in Table 6.7:

	Programme B scenarios							
	Functioning dentition (years)							
	Baseline		Gain offered		After the programme		Total	Impact on inequality
Scenario	Worst	Best	Worst	Best	Worst	Best		
1	64	74	7	3	71	77	10	-4
2	64	74	6	3	70	77	9	-3
3	64	74	5	3	69	77	8	-2
4	64	74	4	3	68	77	7	-1
5	64	74	3	3	67	77	6	0
6	64	74	2	3	66	77	5	+1
7	64	74	1	3	65	77	4	+2

Table 6.7: Potential scenarios for Programme B

The above outlines the values used to populate the scenarios as seen by respondents. It is important to note however that analytically, there is a difference between those who express indifference between programmes by saying they are equally happy versus those who express indifference by switching between programmes. For those who are equally happy between options, their indifference point is identified as the numbers shown in the scenarios as indicated by the table above. For those who switch between programmes, their indifference point is taken to be the mid-point between the previous Programme B and the one currently presented, as has been done in previous BTO exercises (Robson *et al.*, 2017). For example, for a participant who picks Programme B in the first scenario (which offers 71 years functioning dentition to the worse off group), but switches to Programme A in the second scenario (when Programme B offers 70 years functioning dentition to the worse-off group) their indifference point is identified as 70.5 years functioning dentition for the group with the worst oral health and 77 for the group with the best oral health (77 years for the best oral health is fixed, as outlined in Table 6.7). For those two are equally happy at scenario 2, the values would be 70 and 77 years functioning dentition respectively. This is shown in Table 6.8. As picking Programme B would mean asking further questions to identify indifference, this information is only available for Scenario 7 where there are no further questions:

	Scenarios								Choice	Indifference values used for analysis			
	Functioning dentition (years)												
	Baseline		Gain offered		After the programme		Total	Impact on inequality					
										Programme B		Programme A	
	Worst	Best	Worst	Best	Worst	Best				Worst $U_K\,(B)$	Best $U_J\,(B)$	Worst $U_K\,(A)$	Best $U_J\,(A)$
1	64	74	7	3	71	77	10	-4	Programme A	71.5	77	81	67
									Equally happy	71	77	81	67
2	64	74	6	3	70	77	9	-3	Programme A	70.5	77	81	67
									Equally happy	70	77	81	67
3	64	74	5	3	69	77	8	-2	Programme A	69.5	77	81	67
									Equally happy	69	77	81	67

4	64	74	4	3	68	77	7	-1	Programme A	68.5	77	81	67
									Equally happy	68	77	81	67
5	64	74	3	3	67	77	6	0	Programme A	67.5	77	81	67
									Equally happy	67	77	81	67
6	64	74	2	3	66	77	5	+1	Programme A	66.5	77	81	67
									Equally happy	66	77	81	67
7	64	74	1	3	65	77	4	+2	Programme A	65.5	77	81	67
									Equally happy	65	77	81	67
									Programme B	64.5	77	81	67

Table 6.8: Indifference points as used for analysis

Distributional judgements

Now the parameters are known, the indifference points can be aligned with the distributional judgements outlined in section 6.2.4. Table 6.9 shows the different potential patterns of responses, the associated indifference pairings for each programme and the corresponding distributional judgement, where ‘A’ indicated choosing Programme A, ‘B’ indicated choosing Programme B and ‘=’ represents the equally happy choice.

Scenario	Programme Response order	Code	Category	Indifferent between, in years of functioning dentition			
				Programme A		Programme B	
				Best $U_J(A)$	Worst $U_K(A)$	Best $U_J(B)$	Worst $U_K(B)$
1	AAAAAAA	1A	Pro-rich	81	67	77	71.5
	=AAAAAA	1=	Health maximiser	81	67	77	71
2	BAAAAAA	2A	Weighted prioritarian	81	67	77	70.5
	B=AAAAA	2=		81	67	77	70
3	BBAAAAA	3A		81	67	77	69.5
	BB=AAAA	3=		81	67	77	69
4	BBBAAAA	4A		81	67	77	68.5
	BBB=AAA	4=		81	67	77	68
5	BBBBAAA	5A		81	67	77	67.5
	BBBB=AA	5=	Maximin	81	67	77	67
6	BBBBBAA	6A	Egalitarian	81	67	77	66.5
	BBBBB=A	6=		81	67	77	66
7	BBBBBBA	7A		81	67	77	65.5
	BBBBBB=	7=		81	67	77	65
	BBBBBBB	7B		81	67	77	64.5

Table 6.9: Response orderings and their associated distributional judgements and indifference pairs

The intuition behind the response ordering is as follows: AAAAAAA indicates that the participant chose Programme A when presented with the initial scenario, scenario 1. No further questions were asked, but it is implied that their responses for the remaining six scenarios would also be A given Programme B decreases in efficiency as the scenarios continue – i.e. it is unlikely that a respondent would switch from Programme A to Programme B in later scenarios, given the total health available is reduced and the inequality reduction is lower. This has been given a code to aid intuition: 1A, i.e. in scenario 1, the respondent has picked Programme A. An equals sign represents a respondent stating they are equally happy, for example 3= has the response ordering BB=AAAA. This means the respondent picked Programme B in the first and second scenarios but switched their answer to equally happy in the third scenario. Again, since they are asked no further questions it is assumed that their responses to the remaining scenarios would be Programme A, given they are indifferent between A and B in scenario 3 and in scenario 4 Programme B decreases in terms of efficiency and inequality reduction.

Inequality aversion

Given the potential indifference points are known, and assuming anonymity, using the CES HRSWF outlined in equation 1 potential inequality aversion parameters can be calculated. These are presented in the Table 6.10:

Code	Indifferent between				Inequality aversion r
	Programme A		Programme B		
	Best $U_J(A)$	Worst $U_K(A)$	Best $U_J(B)$	Worst $U_K(B)$	
1A	81	67	77	71.5	-1.89
1=	81	67	77	71	-1
2A	81	67	77	70.5	-0.04
2=	81	67	77	70	1.02
3A	81	67	77	69.5	2.21
3=	81	67	77	69	3.62
4A	81	67	77	68.5	5.38
4=	81	67	77	68	7.81
5A	81	67	77	67.5	11.91
5=	81	67	77	67	Undefined (divided by 0)
6A	81	67	77	66.5	Undefined
6=	81	67	77	66	Undefined
7A	81	67	77	65.5	Undefined
7=	81	67	77	65	Undefined
7B	81	67	77	64.5	Undefined

Table 6.10: Indifference pairs and their associated inequality aversion parameter, r

Using the median response from the preference elicitation exercise, the associated inequality aversion parameter can be identified. Up until this point, a neutral framing has been used (i.e. the best and worst oral health) despite oral health inequalities being a factor of socioeconomic status. This is because as anonymity cannot be guaranteed when groups are framed socioeconomically as outlined by section 6.3.3. By asking the initial scenario using a neutral framing, this is thought to capture the closest representation to true inequality aversion which can then be weighted by socioeconomic status through asking the same trade-off question (to the same respondents) to assess if – and to what extent – socioeconomic status impacts the indifference point. The structure follows the same as outlined in 6.4.4, but instead of describing the groups in terms of the best and the worst oral health they are described as the richest and poorest. After this is completed, eq. 4 is then used to derive the weights for the groups. As this depends on both the inequality aversion

parameter, and the indifference points from the two exercises, and cannot be done until the median indifference point is known. The next section provides the context in which the scenarios above are placed.

Contextualising the scenarios in the BTO exercise

Whilst the scenarios have already been presented in isolation and discussed in previous sections, for participants answering the preference elicitation exercise the scenarios are the final step of the preference elicitation process. The BTO itself can be described in four stages. The first stage introduces the notion of constraint (i.e. having to make choices with limited resources), the second stage introduces the inequality, the third stage introduces the initial scenario – which participants are asked to choose between in the fourth stage, with the goal of finding indifference between the two programmes. Each of these stages are presented below.

Introducing the problem and perspective

For any preference elicitation exercise, the participant needs to be introduced to two important considerations: firstly, the underlying issue to be addressed, and secondly they perspective to be used in the exercise. As has been discussed previously, the context of this exercise is decision-making under constraints, specifically how to use (limited) NHS resources in dentistry. There are several options for perspective which can be used in preference elicitation exercises such as this – see (Tsuchiya and Watson (2017) and (Dolan *et al.*, (2003) for a comprehensive list. The appropriate perspective to use depends on considerations such as whether the groups who are affected are known, how broad the considerations should be (i.e. personal preferences for individual treatments or a decision-maker allocating resources), and if the perspective is ex-ante or ex-post.

As this exercise is focused on use of NHS resources at a national level, meaning it is about which programmes to fund within the NHS for the entirety of the English public, and the outcomes are about the impacts on oral health for groups of people, the perspective needs to account for this. However, as the core of the issue is about what value judgements – i.e. what we as a society, would like the NHS dental service to reflect as opposed to what policy-makers desire for NHS resource allocation use it is not suitable to use a policy-maker perspective. It is also important to consider that the participant may be a user of NHS dental services where they may pay for it directly, or they may use private services, and subsidise NHS dental services through taxation. It is therefore not possible to entirely separate a self-interested angle. The

perspective to be used therefore needs to reinforce that the exercise is about societal values and dissuade from participants from picking an option which will benefit them the most.

The perspective used in this exercise asked participants to consider a hypothetical scenario where their answers would be used to help understand how the public would like NHS resources to be used in dental care. This allows for participants to provide their views about what they think NHS resources should be used for, without asking them to be a decision-maker and therefore allows them to reflect their values instead of what they think and believe a policy-maker should be doing. In order to reduce the potential for self-interested answers, the introduction stated that these decisions are about *investing* in dental services. The vehicle of investment, instead of immediate provision, was used so any pay-off would be in the future and therefore would not address the participant's immediate need or desires. The exact text used is provided in Figure 6.3:

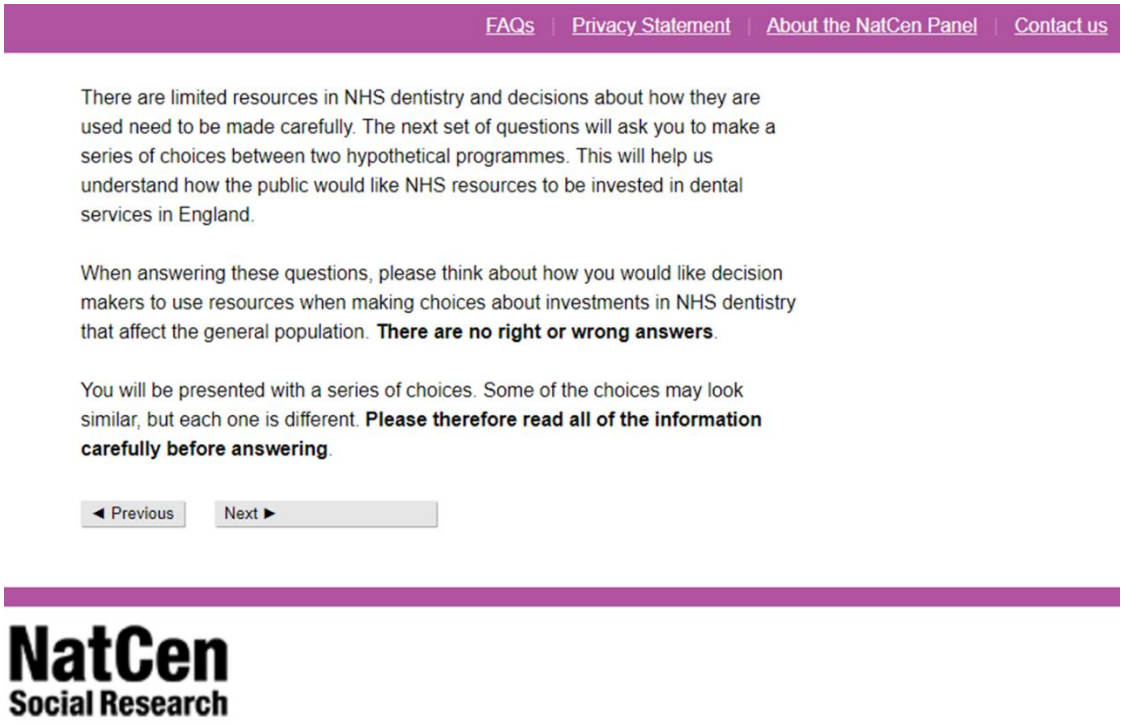

Figure 6.3: Introduction to the BTO exercise

Introducing the inequality

Next, the measure of years of functioning dentition was introduced and a formal definition was provided. The notion of inequality was also introduced, and a table presented the inequality in years of functioning dentition to be used as the baseline

for oral health in the exercise. A table was chosen for the formatting to build familiarity with the tabular format. This is provided below in Figure 6.4:

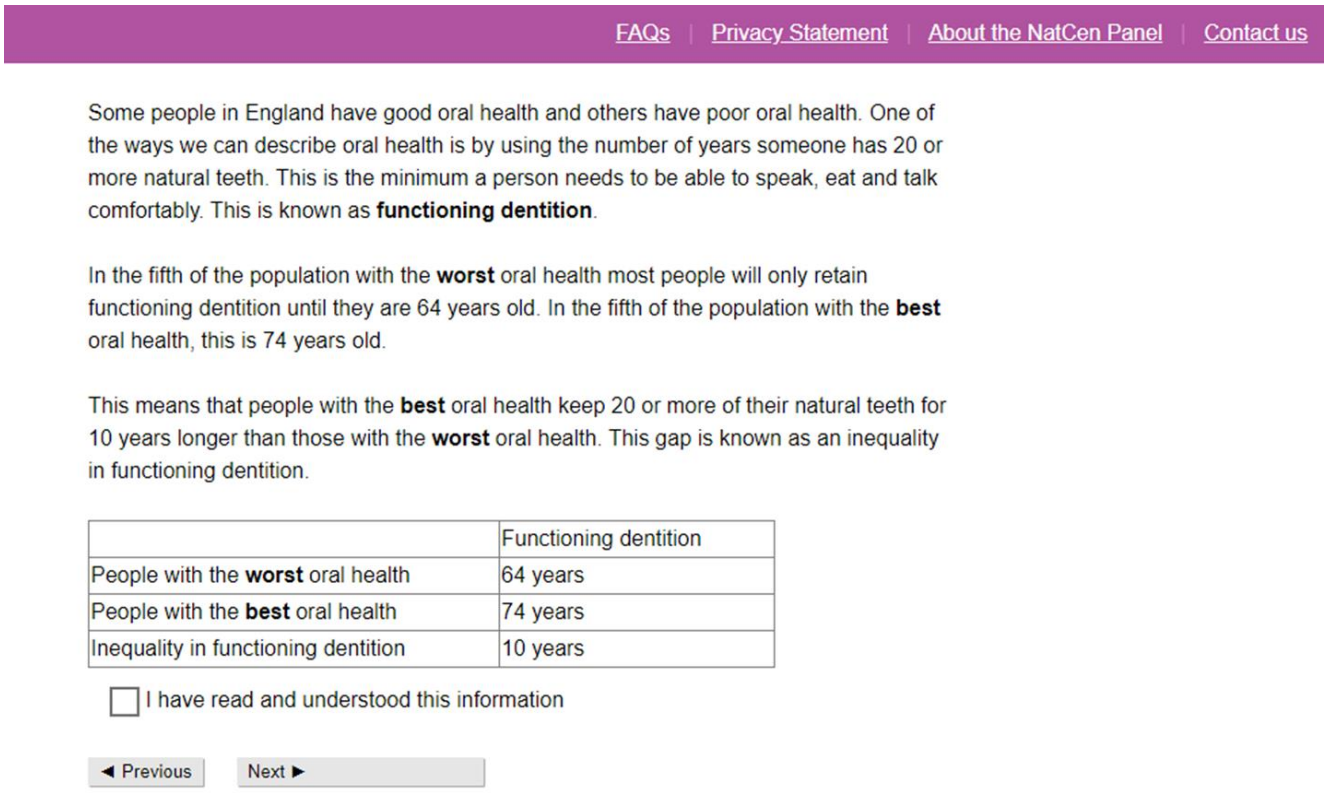

Figure 6.4: Inequality table used in the BTO exercise

Introducing The BTO

The next step introduced the choice exercise. The choice exercise begins by reinforcing the perspective to be used in the exercise: that the exercise is hypothetical, but to imagine their answers will be fed back to policy makers who have to make decisions about how to use NHS resources. As mentioned earlier in this section regarding the calculation of the inequality aversion parameter, there are two framings which will be used: a neutral framing and a socioeconomic framing. For the first choice set, the language used to describe the groups is neutral and therefore the groups are described in terms of those with the 'best' and 'worst' oral health. The order is fixed, with the neutral framing always presented first. This is because

presenting the socioeconomic framing first would introduce that the poorest groups have the worst oral health, and therefore would bias their neutral answers.

As outlined earlier in this section regarding the scenarios, two programmes are presented to the participants, Programme A and Programme B. The table describes the key information: the initial inequality, the additional years functioning dentition offered to each group in each programme, the total additional years functioning dentition and finally the impact on inequalities. Figure 6.5 shows this information as it was presented to respondents for the first scenario in the neutral framing, whilst Table 6.11 shows the difference in how this is presented across the two framings.

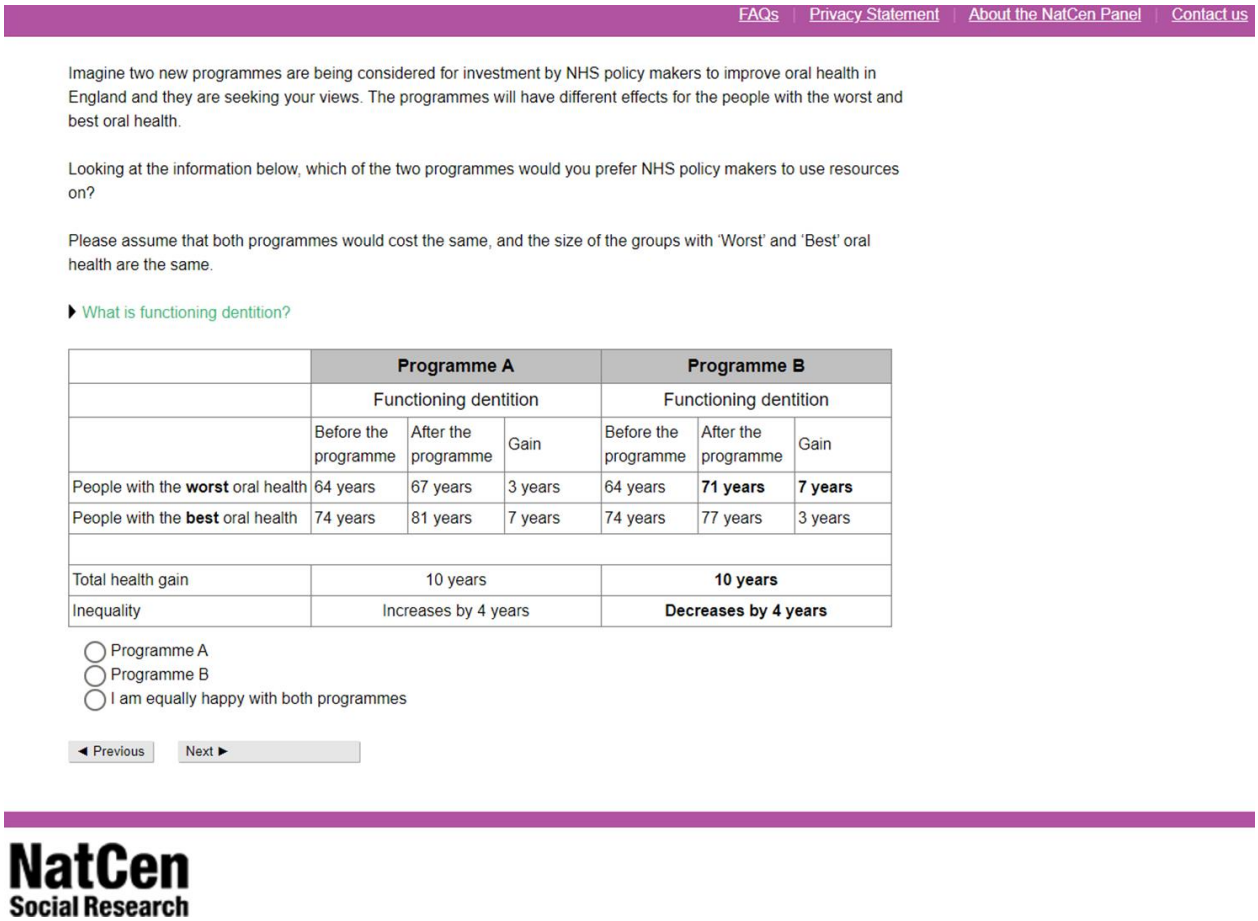

Figure 6.5: Scenario 1 in the neutral framing

SCENARIO 1								
Choice set		Programme A			Programme B		
One (always seen first)	Two (always seen second)	Functioning dentition			Functioning dentition		
Neutral framing	Socioeconomic framing	Before the programme	After the programme	Gain	Before the programme	After the programme	Gain
People with the **worst** oral health	People from the **poorest** backgrounds	64 years	67 years	3 years	64 years	71 years	7 years
People with the **best** oral health	People from the **richest** backgrounds	74 years	81 years	7 years	74 years	77 years	3 years
Total health gain		10 years			10 years		
Inequality		Increases by 4 years			Decreases by 4 years		

Table 6.11: Difference in neutral and socioeconomic framings using Scenario 1 as an example

Finding indifference

During the set-up to the exercise (in Figure 6.3), participants are told there is a series of choices available, but there are no specifics regarding how many subsequent choices are offered. As previously described, the preference elicitation exercise progresses as follows: Participants are asked to make a choice: Programme A, Programme B, or to state they are equally happy with the two. This choice dictates if there are any subsequent choices, and what indifference value is to be used for analysis (as outlined in table 6.8). Indifference is determined in one of three ways: for scenario 1, if they pick Programme A there are no subsequent choices – as Programme B will decrease the additional years functioning dentition to the worse-off group in later scenarios. If participants select the equally happy option, or they switch from Programme B to the equally happy option, there are also no subsequent choices, as they have expressed indifference between the two programmes. If participants select Programme B, then the scenarios continue systematically from scenario 1 to scenario 7, with Programme B decreasing the additional years functioning dentition to the worse-off group incrementally, until the respondent switches to Programme A. Then no subsequent choices are offered. Figure 6.6 offers a summary of the choices and potential pathways.

The final scenario offered to respondents outlines a case where the worse-off group receives an additional year functioning dentition. This particular specification does not take the additional years functioning dentition for the worse-off group to zero as it was assumed that some oral health gain would be preferable to no oral health gain. Consequently, for participants who reach Scenario 7 and continue to pick Programme B it is assumed that they would switch to Programme A.

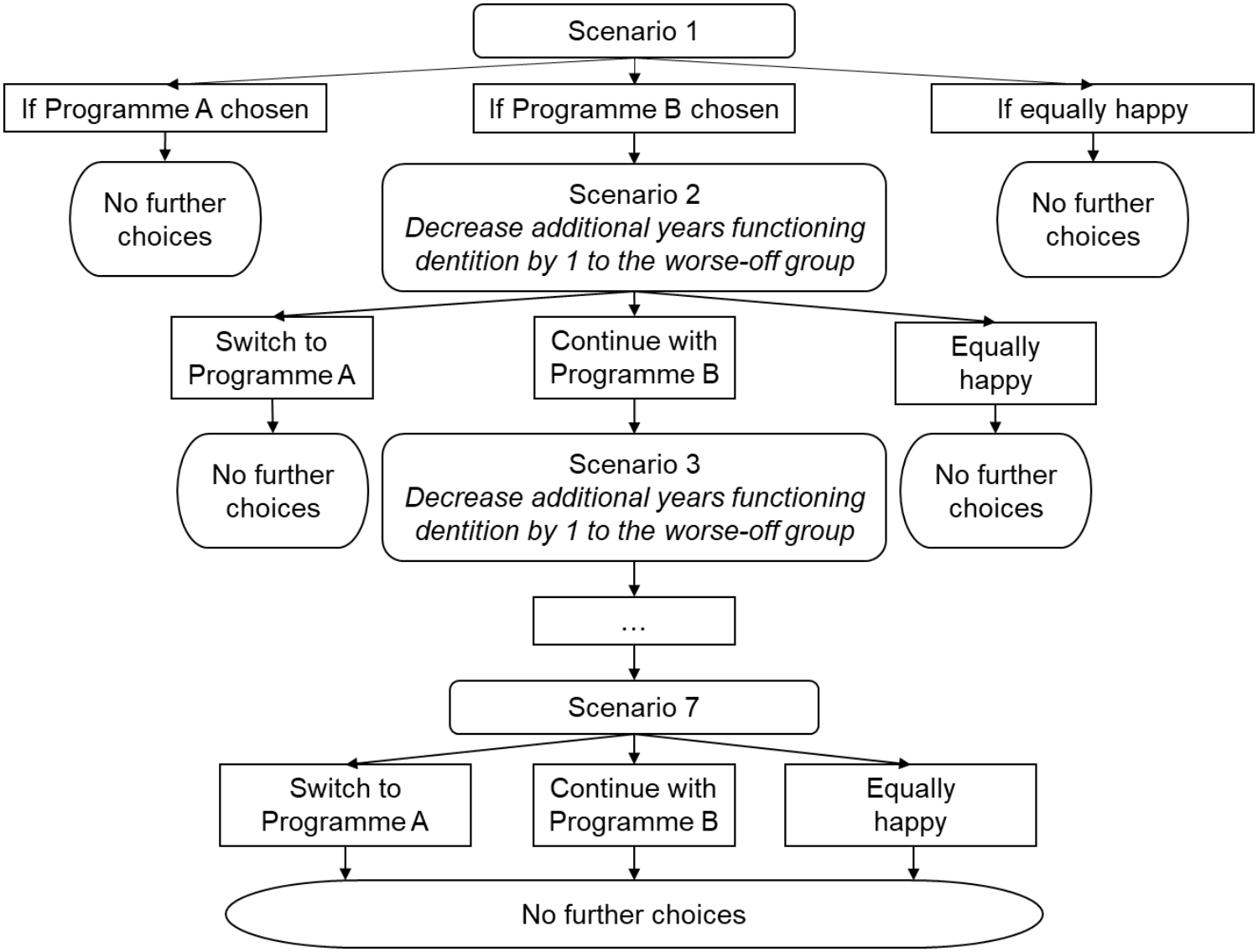

Figure 6.6: Potential pathways for respondents

6.5 The Questionnaire

The following sections describe the broader questionnaire design, and how the preference elicitation exercise described is integrated into the wider survey. The final survey design was developed using informal feedback from a convenience sample, with two formal piloting stages described in section 6.5.2.

6.5.1 Questionnaire design

As an overview, the survey has three broad parts. Part one asks participants about their oral health status, part two is the BTO as described in section 6.4, and part 3 asks participants opinions on a range of societal issues. Standard sociodemographic information (such as age, gender, National Statistics Socio-Economic Classification, or NSSEC) was not requested as part of this questionnaire, as the panel used to complete the questionnaire provides this information as standard. This will be described further in section 6.5.3. Parts 1-3 of the survey are described in the following sections.

Part One: Sociodemographic information and oral health status

The first section gathers information about the participants' oral health status. Answering these questions before the preference elicitation exercise provides an opportunity for participants to 'warm-up' to the exercise and to think about oral health. This data will also be used for later analysis (i.e. identifying if participants own oral health impacts their responses). The questions reflect those collected by part of the ADHS in 2009 and include:

- Dental health (general)
- Number of natural teeth
- Number of teeth lost/removed for non-cosmetic reasons
- Frequency of dental visits
- Dental care provider (i.e. private or NHS) and payment (for example, NHS co-charge or private insurance scheme)

The questions and their potential responses can be found in the appendix, item I. The other sociodemographic information was not collected specifically as part of this survey, as the data collection entity (NatCen) has the necessary information as part of their continual panel. This includes:

- Sex
- Age

- Ethnicity
- Education
- Relationship status
- Parent
- Job status
- Household income
- Political stance

Part Two: the Benefit Trade-Off

Section 6.4 described the preference elicitation portion of the questionnaire. Some details which have not been mentioned are the features which were built in to encourage and check engagement. Specifically, at the start of the exercise where participants are introduced to the concept of functioning dentition they were presented with a check-box to acknowledge that they have read and understood the information. If participants spent less than 10 seconds on this page, there was a pop-up box highlighting that they had not spent much time on the page and asked participants to carefully read the information before proceeding. Finally, when the choice sets swapped between the neutral framing and the socioeconomic framing participants are again presented with a check-box to acknowledge they have read and understood the information, specifically that the scenarios are now talking about the richest and poorest in society. Again, if less than 10 seconds is spent on the page they are alerted to the importance of the information.

Part Three: Attitudinal questions

Finally, participants are asked a series of statements regarding their political values, opinions regarding inequalities, and the beliefs about how individual responsibility should (not) impact distribution of NHS resources.

The attitudinal statements asked of participants were based on a study using a PTO for inequality-efficiency trade-offs in health in England (McNamara, 2021). There are 10 different statements which are scored on a 5 item Likert scale from ‘strongly agree’ to ‘strongly disagree’. These statements can be found in the appendix, item J. In the study by McNamara (2021) these statements were developed using qualitative data, and therefore provide an evidence-based value statement section relating to thoughts and opinions of the use of NHS resources. These statements were used as the basis of the attitudinal statement section as conducting study specific qualitative research to develop a similar section was beyond the scope of this study. The

statements were adjusted to the context of oral health. By basing the value statements on an existing survey, this also allows comparison between results of this work and other more general health studies and can give insight into whether participants hold different values for the NHS in terms of general health and oral health.

6.5.2 Piloting

The final survey design was developed using informal feedback from a convenience sample, and two stages of formal piloting (think-aloud interviews and online surveys).

One decision that was made prior to formal piloting was based on initial feedback from a convenience sample. This was about how to present the information to respondents, with both options of a graph and a table format presented. Previous studies using a BTO have often presented the trade-off using a graph (see the appendix of Dolan and Tsuchiya (2011) for an example). Ultimately the feedback from this sample was that the table was a clearer and more concise way of presenting the key information and was taken forward to the formal piloting stage. Random ordering of the scenarios was also tested at this stage, but the cognitive burden was found to be too high, causing confusion and ultimately disengagement from the exercise. At this point it was decided that any ordering of scenarios should be sequential.

Using Qualtrics software to build a replica of the survey to be administered by NatCen, four think-aloud interviews were undertaken with participants from the members of the public qualitative study. Participants were offered a £25 voucher in return for their time and input. After this feedback (discussed in the next paragraph) was incorporated into the survey design, 45 members of the public recruited through an online research platform (NIHR people in research, (NIHR, 2024)) and were emailed links to surveys. Participants were asked to complete the oral health questions, one choice set for the BTO, and the attitudinal statements. Participants were also provided an opportunity to give generic feedback about the survey, some of which is provided in the appendix (item K). This data was used to review and refine the survey design. Participants who completed surveys received a £5 voucher.

Feedback from the think-aloud interviews made it clear that the participants were making decisions based on the information displayed in the table, and changes in the text above and below the table were not considered to the same extent. As a result,

all essential information was presented in tabular form and changes were highlighted between the scenarios. This format was taken forward to the online surveys to be administered to a wider piloting sample. The results from the online survey participants indicated that participants would be willing to trade in the scenarios but did highlight there was a potential for clustering at scenario one. This issue will be addressed in the next chapter. As a result of this feedback, further changes to the wording were made.

6.5.3 Sample Size

Previous studies using a BTO in health have not conducted a formal sample-size calculation (see, for example Robson et al., 2017). In order to inform what would be considered a reasonable sample size for this preference elicitation exercise the different sample sizes from the literature were used as a reference point. Robson et al., (2017) for example had a total sample size of 460 resulting in a useable sample of 244 respondents, whilst Abásolo & Tsuchiya (2013) had a total sample size of 1,211 randomised resulting in 1,013 useable data points. These participants were randomised across three different variations, leading to each variation having a sample size of n1=327, n2=345 and n3=341 respectively. Both of these studies raise the issue of needing to exclude data points due to validity, but with a large amount of variation within necessary exclusions (from 47% in Robson et al., (2017) to 17% in Abásolo & Tsuchiya (2013)). There was anticipated to be less exclusions due to inconsistency (which was the source of the majority of responses being excluded in Robson et al., (2017)) due to the differences in the design of the study, however there was agreement to expect some loss of data due to incomplete responses. This study also had a pragmatic constrain of funding associated with the administration of the questionnaire. It was therefore determined that a minimum sample size of 400 would be considered sufficient and allow for a reasonable degree of data loss due to incomplete responses.

6.5.4 Questionnaire Administration

The National Centre for Social Research (NatCen) was employed to administer the survey. NatCen offers an Opinion Panel which is representative of the UK public across sociodemographics such as age, sex and ethnicity (NatCen, 2024). This sample is recruited through the British Social Attitudes survey, where participants are selected at random from the general population using the Postcode Address File (PAF). A random sub-sample of participants from the Opinion Panel were invited to

complete the survey on the 3rd of November 2022 and data collection finished on the 4th of December 2022. The survey was part of a larger package of surveys sent to participants to complete. In the first instance, participants were offered £10 for completion of the survey. As data collection progressed, demographics which were under-represented were offered £20. The questionnaire was only available on an online format as the trade-off format would not have translated to being completed over the phone, and having the survey completed face-to-face would have reduced the potential sample size.

6.6 Results

577 participants were recruited and completed the survey. The next section describes the descriptive statistics.

6.6.1 Descriptive Statistics

Table 6.12 shows some of the key socio-demographic characteristics of the sample, with percentages in parenthesis and comparison data from the Office for National Statistics (2022) where available.

Demographic	Sample (n=577)	National distribution (in percent)
Sex		
Female	323 (55.98)	50.1
Age		
18-29	40 (6.93)	12.3
30-39	99 (17.16)	13.4
40-49	100 (17.33)	12.3
50-59	105 (18.20)	13.5
60-69	109 (18.89)	11.2
70+	123	14.2

	(21.32)	
Not provided	1 (0.17)	
Education		
Degree or equivalent and above	264 (45.75)	33.8
A levels or equivalent	103 (17.85)	16.9
Other qualifications below A levels or equivalent	145 (25.13)	23
Other (including no qualifications)	65 (11.26)	26.3
Latest main economic activity		
Paid work	299 (51.82)	75.2
Unemployed	10 (1.73)	3.9
Retired	142 (24.61)	20.9
Other/not provided	126 (21.83)	
Household income		
£1,410 or less pm	102 (17.68)	
£1,411 - £2,560 pm	150 (26.00)	
£2,561 - £4,350 pm	146 (25.30)	
£4,351 or more pm	158 (27.38)	
Not provided	21 (3.64)	
Ethnicity		
White British	472	81.7

	(81.80)	
Other	105 (18.20)	18.3

Table 6.12: Descriptive statistics for main analysis

The median household income for 2022 was £32,300 (comparative banding was not found in available data). Whilst the survey demographics are largely comparable, there is over-representation of the retired population and a corresponding elevation in the 70+ age category. Those without qualifications were over-represented.

6.6.2 Health and oral health related frequencies

Table 6.13 presents summary statistics of the samples own self-rated health, oral health and their use of dental services more generally. As these questions were based on the ADHS issued in 2009, the comparative statistics as a percentage from the ADHS are provided.

	Sample representation (n with % in parenthesis)	ADHS (2009) (as a % of the ADHS sample)
General health		
Respondents with long-standing health condition	203 (35.19)	33.22
Dental health		
Good	328 (56.84)	71.44
Fair	183 (31.72)	21.20
Bad	66 (11.44)	7.25
Respondents with functioning dentition	447 (77.47)	47.52
Dental attendance		
Regular (1 or more times every 2 years)	441 (76.43)	73.4

Irregular	130 (22.53)	24.71
Type of service used		
Private dental care	181 (31.37)	27.34
NHS dental care that you paid for	291 (50.43)	43.69
NHS dental care that was free	71 (12.31)	23.35

Table 6.13: Health and oral health descriptive statistics for analysis

Compared to the data from ADHS in 2009, the sample in this study generally have lower self-rated oral health but more believe they have functioning dentition. When using NHS dental services, more of this study sample pay for their dental care. Interesting, although this data was collected in 2022, more respondents identify as regular attenders.

6.6.3 Attitudinal Statements

Table 6.14 shows the extent to which participants agreed or disagreed with the value statements.

Statement	Agree	Neither agree nor disagree	Disagree	Other[9]
The NHS should prioritise the oral health of poorer people over wealthier people	269 (46.62)	152 (26.34)	156 (28.03)	0
It shouldn't matter if you are poorer or wealthier, the NHS should value improvements to everyone's oral health equally.	413 (71.58)	91 (15.77)	72 (12.48)	1 (0.17)
When the NHS makes decisions about oral health, they should focus on the overall amount of benefit being provided, not who that benefit goes to.	317 (54.94)	138 (23.92)	121 (20.97)	1 (0.17)
The NHS should just focus on improving the average oral health of people in the country, they shouldn't consider whether or not different groups of people have different levels of oral health.	294 (50.95)	127 (22.02)	156 (27.03)	0
The NHS should try and reduce the functioning dentition gap between poorer and wealthier people, even if this means average years of functioning dentition in the overall population will be lower.	318 (55.11)	171 (29.64)	87 (15.08)	1 (0.17)
When the NHS makes decisions about oral health, they should focus on people with fewer years of functioning dentition.	229 (39.69)	233 (40.38)	115 (19.93)	0
I believe that income and oral health are related.	427 (74)	94 (16.29)	55 (9.53)	1 (0.17)

[9] Other responses include ‘Don’t know’ and ‘Prefer not to answer’

Statement	Agree	Neither agree nor disagree	Disagree	Other
In oral healthcare, preventative actions should receive higher priority than treatments.	383 (66.37)	147 (25.48)	47 (8.15)	0
The NHS should not prioritise oral health. Individuals are responsible for their own oral health.	126 (21.84)	137 (23.74)	314 (54.42)	0
Wealthier people should pay privately for their own oral healthcare. They are not dependent on the NHS for their oral health.	242 (41.94)	158 (27.38)	177 (30.68)	0

Table 6.14: Attitudinal statements

6.6.4 Data Analysis

Distributional judgements

Figure 6.7 displays the distribution of responses according to their corresponding distributional judgements. This data is displayed in two ways. The first graph in figure 6.7 shows how respondents fall into each category across framings, whilst the figure 6.8 shows the cumulative frequency of the responses. A table can also be found in the appendix (item L).

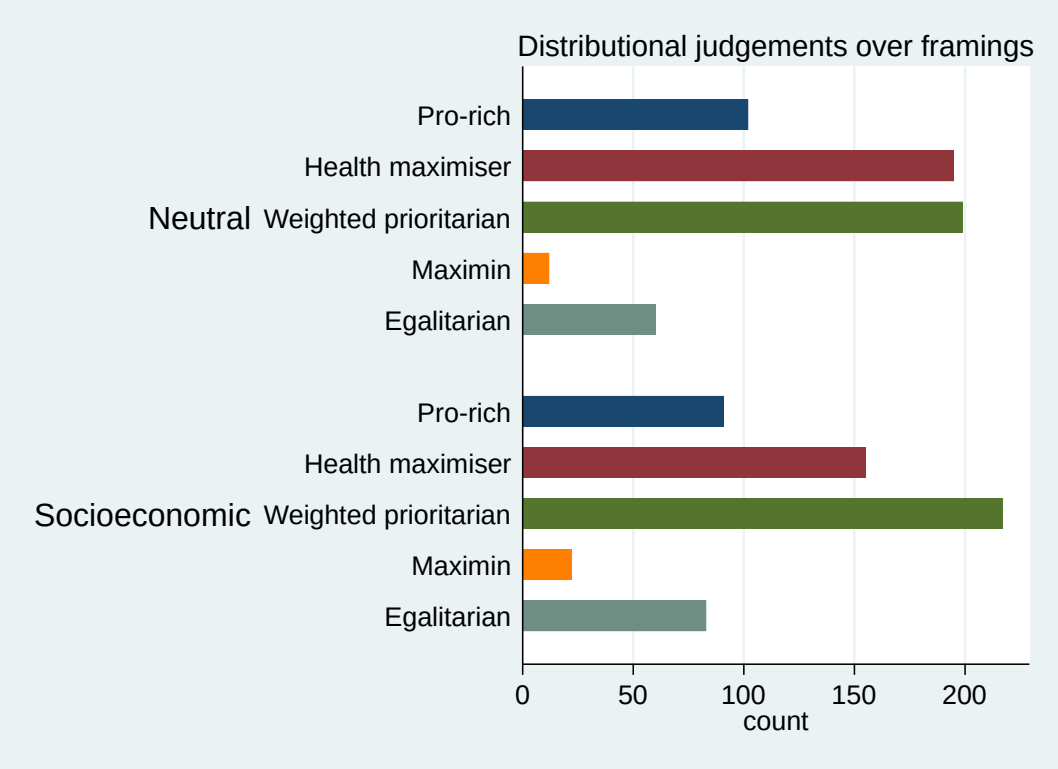

Figure 6.7: Bar chart of responses by distributional judgements

Although there is a change in distribution of responses across framings, the size of the categories follows the same order, meaning that the largest category is weighted prioritarian, followed by health maximisers, then pro-rich, then egalitarian with the smallest being maximin. 35.09% of respondents are weighted prioritarians for the neutral framing, and 37.87% for the socioeconomic whilst the health maximiser category holds 34.21% and 27.05% of respondents for the neutral framing and socioeconomic framing respectively. The pro-rich category has 17.89% in the neutral framing and 16.23% in the socioeconomic, 10.7% are egalitarian in the neutral and 15.01% in the socioeconomic framing, and 2.11% are maximin in the neutral and 3.84% in the socioeconomic.

However, since the inequality aversion parameter is derived according to the median respondent it is important to consider the cumulative frequency of responses and which category the 50th percentile respondent falls into. This is displayed in Figure 6.8 with a red line highlighting at median response at 50%:

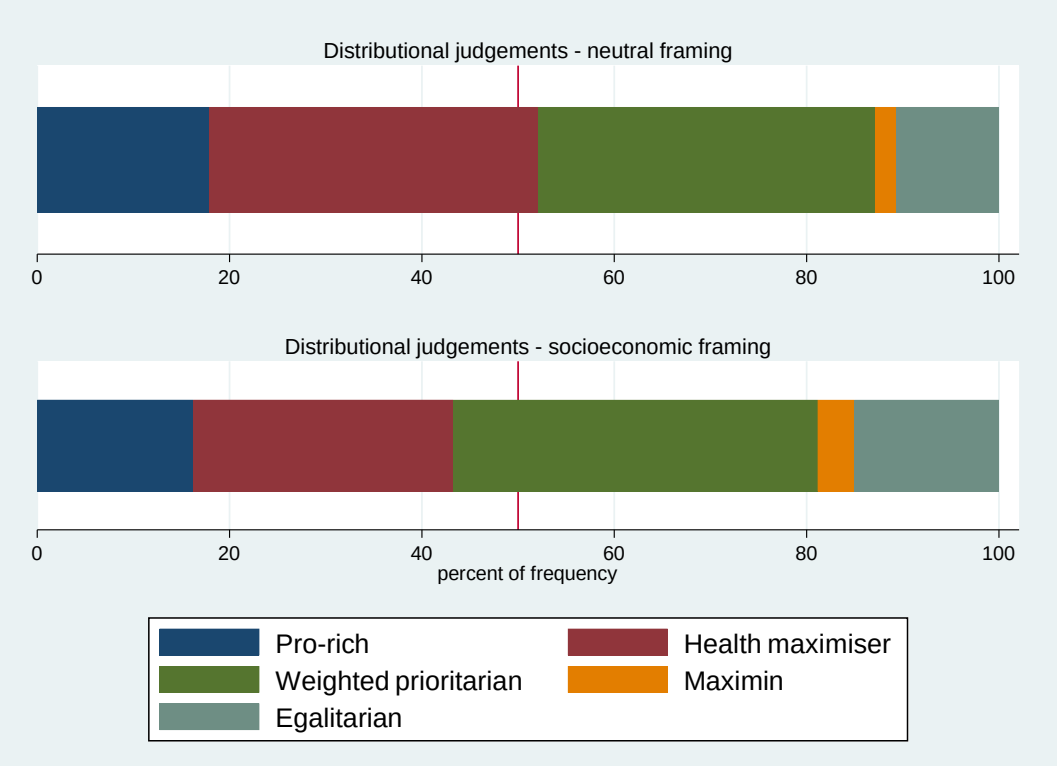

Figure 6.8: Cumulative frequencies of distributional judgements

The median response for neutral framing is health maximiser, whilst for the socioeconomic framing the median response is weighted prioritarian. This means for the derivation of the inequality aversion parameter for use in the context of a social welfare function, which uses the indifference point in both framings, the values to be used are as follows:

- For the neutral framing, the point at which the median respondent is indifferent between the specified parameters and Programme A is a gain of three years functioning dentition for the better off group, giving them a total of 77 years functioning dentition, and 7 years additional functioning dentition for the worst-off group, giving them a total of 71 years functioning dentition. This is the category of health maximiser.
- For the socioeconomic framing, the indifference point falls into the category of weighted prioritarian. As can be seen in the summary Table 6.10 which shows how the categories are defined, the weighted prioritarian category spans

seven different analytical points. The median respondent falls into code 3A, which gives an additional 5.5 years functioning dentition for the worse-off group, totalling 69.5 years functioning dentition for the worst-off group.

The following bar chart, figure 6.9 gives an indication of how functioning dentition impacts the distributional judgements for respondents according to whether or not they have their functioning dentition in the neutral framing (meaning that the distributional judgements are shown as a proportion of respondents within the categories of functioning dentition, or not):

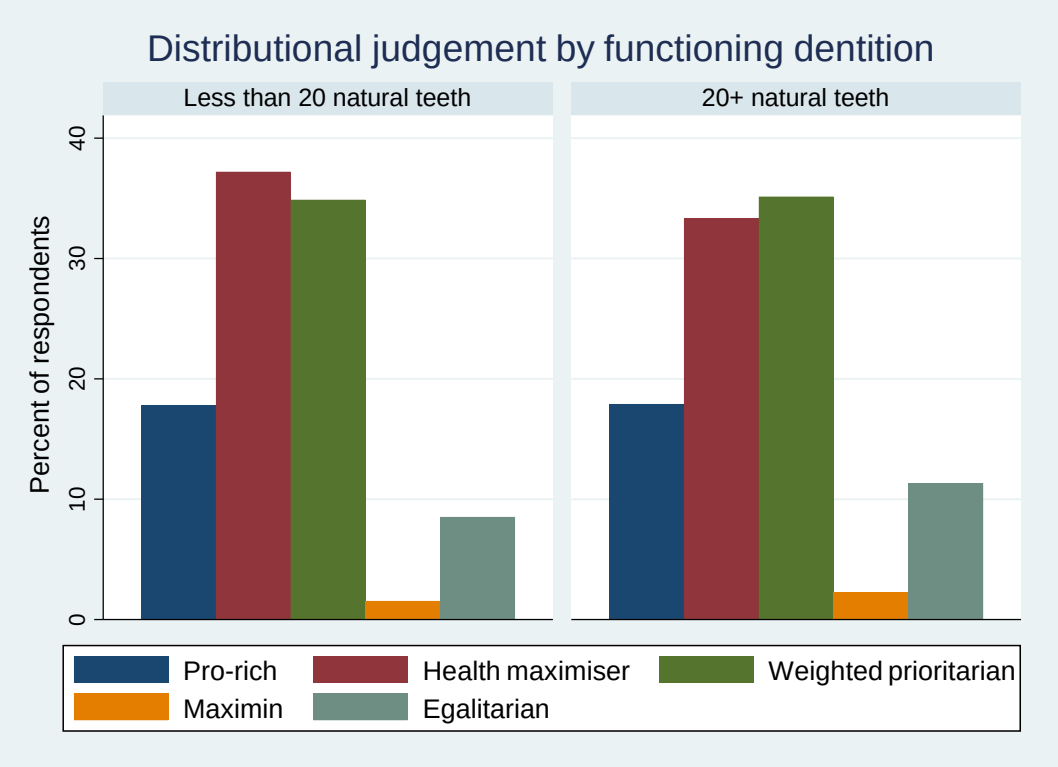

Figure 6.9: Distributional judgement by functioning dentition for the neutral framing

There is little difference to be observed between responses of those who do, and do not, still retain their functioning dentition. Out of the 129 people who do not have functioning dentition, 17.83% are pro-rich, 37.21% are health maximisers, 34.88% are weighted prioritarian, 1.55% are maximin and 8.53% are egalitarian. For the 441 who do have their functioning dentition, the distribution is similar: 17.91% are pro-rich, 33.33% are health maximisers, 35.15% are weighted prioritarian, 2.27% are maximin and 11.34% are egalitarian.

Examining the data according to which dental service provider respondents last saw however yields a difference, as can be seen in figure 6.10:

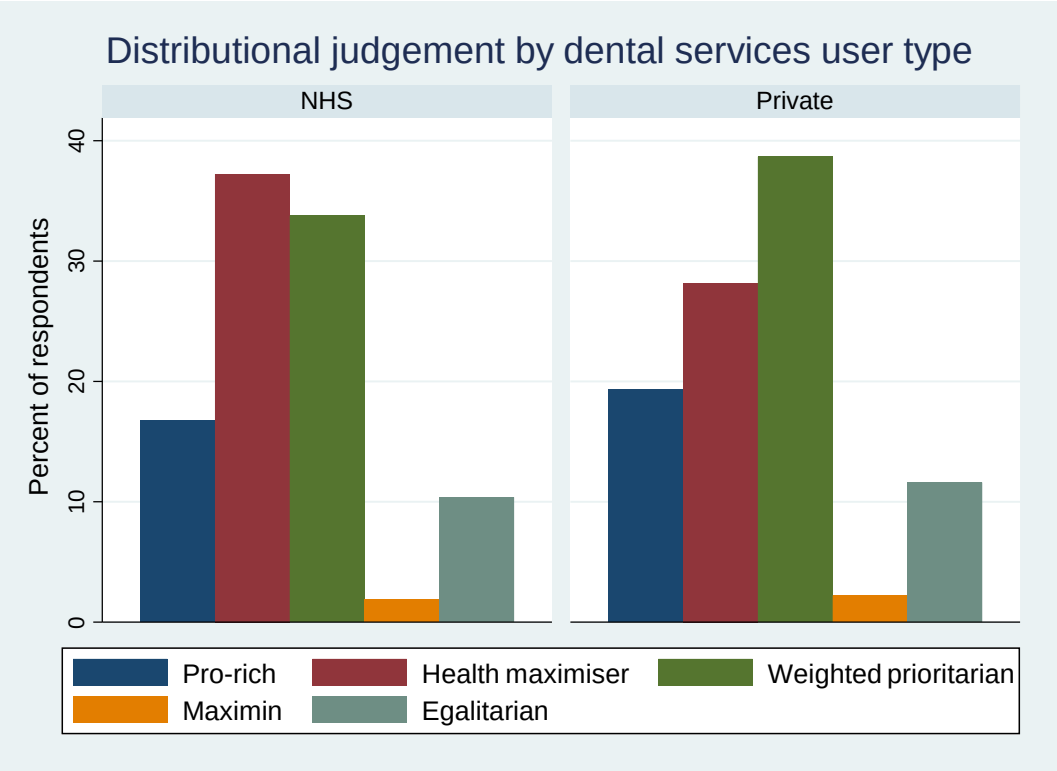

Figure 6.10: Distributional judgement by dental service provider for the neutral framing

Of the 181 who most recently used private dental services, the majority of respondents are weighted prioritarians (38.67%), followed by health maximisers (28.18%), pro-rich (19.34%), egalitarians (11.60%) and finally maximins (2.21%). For those who used NHS services (n=376) the largest category is health maximisers (37.23%), followed by weighted prioritarians (33.78%), pro-rich (16.76%), egalitarians (10.37%) and finally maximins (1.86%).

The following bar chart, figure 6.11, shows the different distributional judgements for the neutral framing and how participants responded to the statement: "*The NHS should not prioritise oral health. Individuals are responsible for their own oral health.*" (i.e. individual responsibility) in the neutral framing:

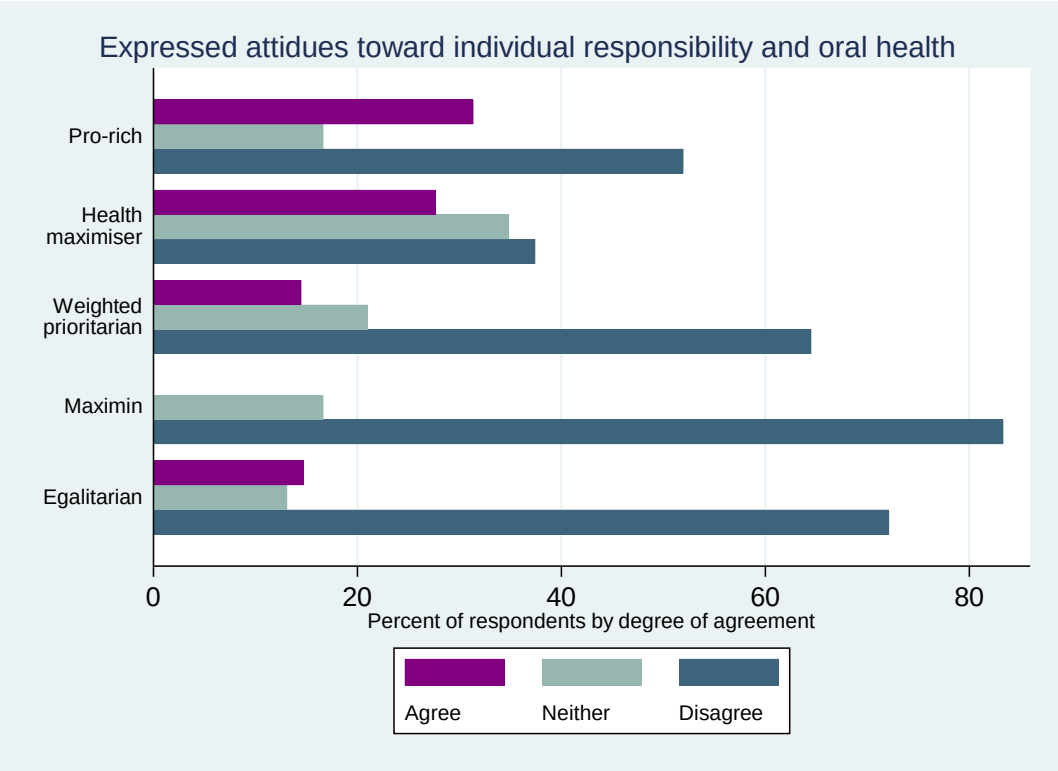

Figure 6.11: Attitudes toward individual responsibility and oral health by distributional judgement

Over 30% of respondents in all categories disagree with the statement regarding the NHS not prioritising oral health as individuals should be responsible for their own oral health across all distributional judgements. However, the distributional judgements where there is the largest degree of agreement is pro-rich and health maximiser.

Figure 6.12 examines responses to the statement *"The NHS should try and reduce the functioning dentition gap between poorer and wealthier and poorer people, even if this means average years of functioning dentition in the overall population will be lower."* in the socioeconomic framing:

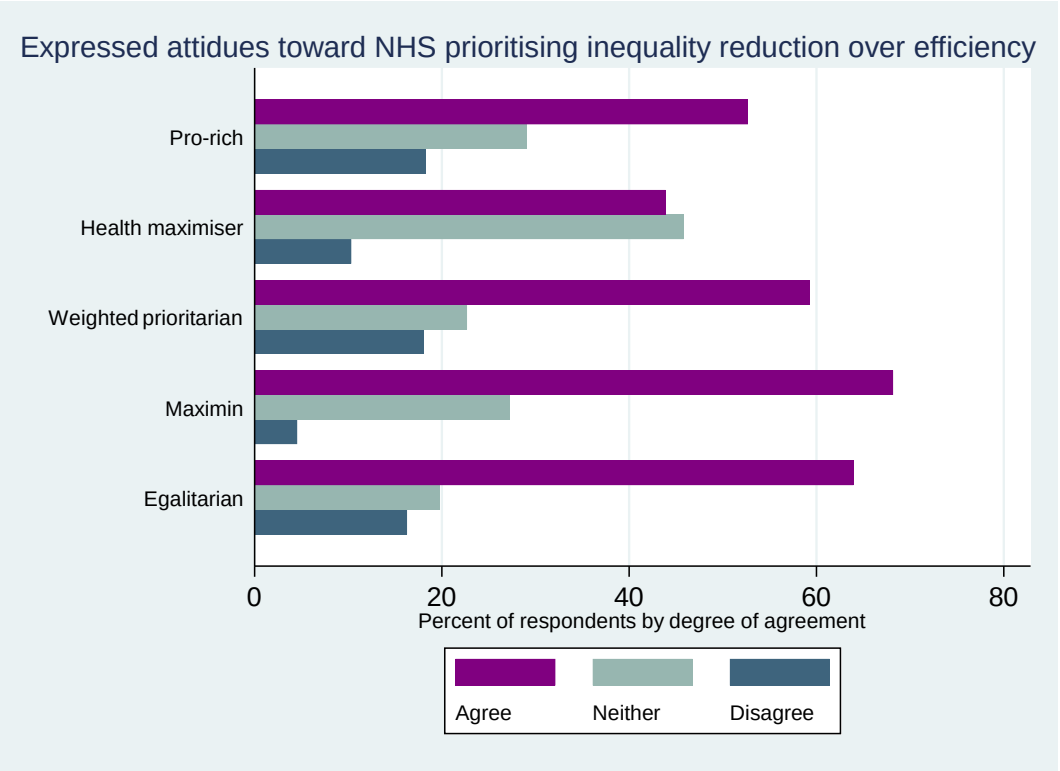

Figure 6.12: Attitudes toward prioritising inequality reduction over efficiency by distributional judgement

Over 60% of respondents who are identified as maximin and egalitarian agree with the statement, however, across most distributional judgements respondents are more likely to agree with the statement than not (with the exception of health maximisers most of which neither agree or disagree with the statement).

Inequality aversion parameter

To calculate the inequality aversion parameter for the CES HRSWF following the method outlined in 6.3 the median value (50th percentile) is used. The parameters describing the median indifference point for both the neutral and socioeconomic framing are displayed in Table 6.15:

Parameter values for indifference point *(years of functioning dentition to groups K and J by Programme)*				**Inequality aversion parameter** $\boldsymbol{r}$
Neutral Framing				
Programme A		Programme B		
Best $U_J\,(A)$	Worst $U_K(A)$	Best $U_J\,(B)$	Worst $U_K(B)$	
81	67	77	71	1.02
Socioeconomic framing				
Programme A		Programme B		
Best	Worst	Best	Worst	
$U_J\,(A)$	$U_K(A)$	$U_J\,(B)$	$U_K(B_S)$	
81	67	77	69.5	2.21

Table 6.15: Trade-off indifference points and their associated inequality aversion parameters for both framings

In context, this means in the neutral framing the median respondent was indifferent between Programme A where those in the better-off group have 81 years of functioning dentition, and those in the worse-off group have a functioning dentition of 67 years, and Programme B where those in the better-off group have a 77 years of functioning dentition, and those in the worse-off group have a functioning dentition of 71 years. The inequality reduces by four in relation to the baseline.

For the socioeconomic framing, there is a change in indifference point and the median respondent is indifferent between programme A (which is the same as previously, an increase of 7 years functioning dentition and an increase of 3 years functioning dentition to the worse-off group) and Programme B at an increase of 3 years functioning dentition to the better-off group and 5.5 years to the worse-off group. Between the two scenarios, there is a difference of additional years functioning dentition of 1.5.

The median respondent has an inequality aversion of 1.02 in the neutral framing, and 2.21 in the socioeconomic framing. This indicates that inequality aversion is stronger for oral health when related to socioeconomic status, and that who has the best and worst oral health impacts answers – i.e. that anonymity does not hold. Given how the

MRSS is derived, only the inequality aversion parameter for the neutral framing is used going forward. The difference in responses for the neutral and socioeconomic framing is used to determine and therefore weight the groups appropriately in the CES SWF.

Anonymity

As can be seen in the previous two sections the above change in indifference point between framings. This provides evidence that there is a difference in the equity-efficiency trade-off when the groups are presented neutrally, versus when they are presented by socioeconomic status. This difference is also presented in the cumulative distribution in figure 6.13, which displays the indifference point in relation to all the different analytical points displayed in table 6.10:

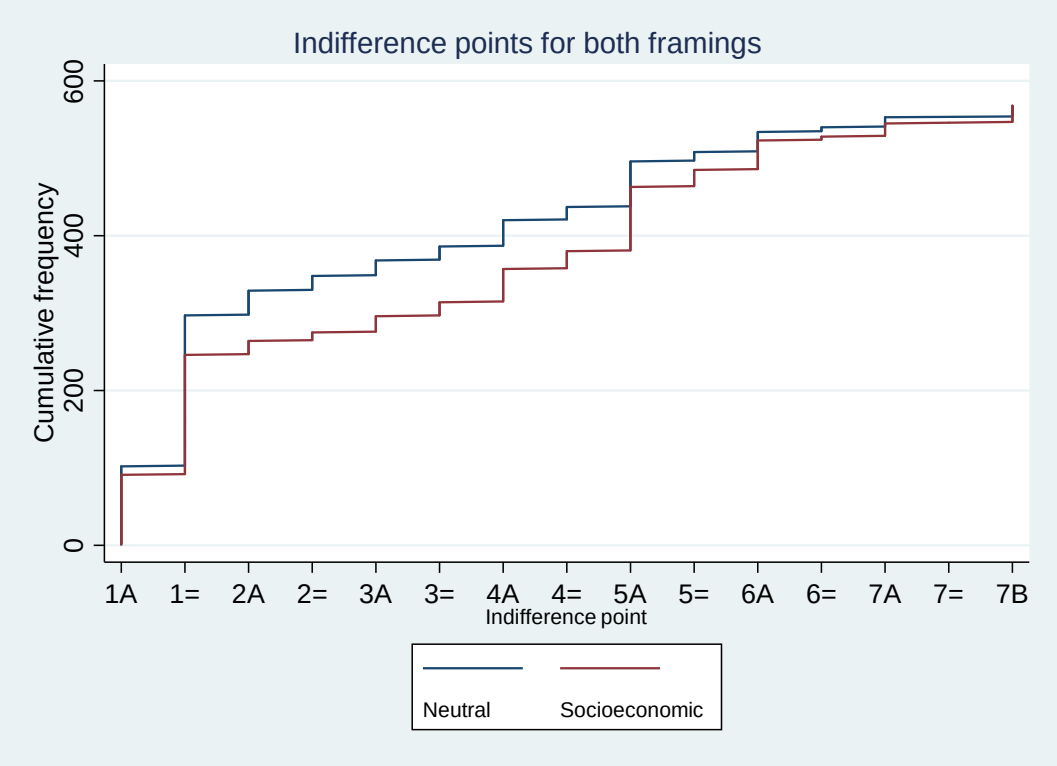

Figure 6.13: Cumulative frequency of trade-off indifference points for both framings

The consequence of this is that for the derivation of the MRSS it cannot be assumed that the groups are treated equally (i.e. anonymity does not hold and there are non-health considerations which should be included in the HRSWF) and therefore $\alpha \neq 0.5$. How responses change at the individual level (i.e. if there is no change, if participants pick a programme which offers more health, or one which is more egalitarian) is shown in figure 6.14:

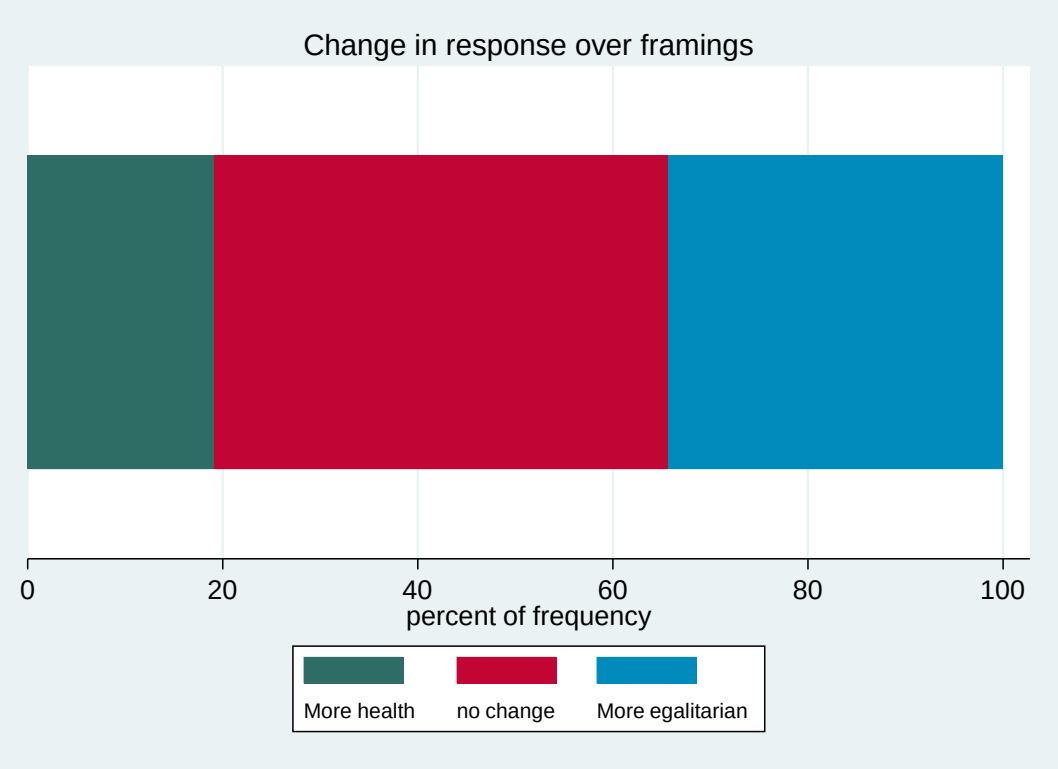

Figure 6.14: How responses change over neutral and socioeconomic framing

When framed socioeconomically, 19.19% prefer an option which offers more health to the socioeconomically deprived group, there is no change in 46.48% of the answers, and the final 34.33% choose an option which trades-off more (i.e. they are willing to accept less health for the worse off group to reduce inequalities). Breaking this down according to the attitudinal statement on the NHS taking into account socioeconomic status into the resource allocation decisions, the distribution is shown in figure 6.15:

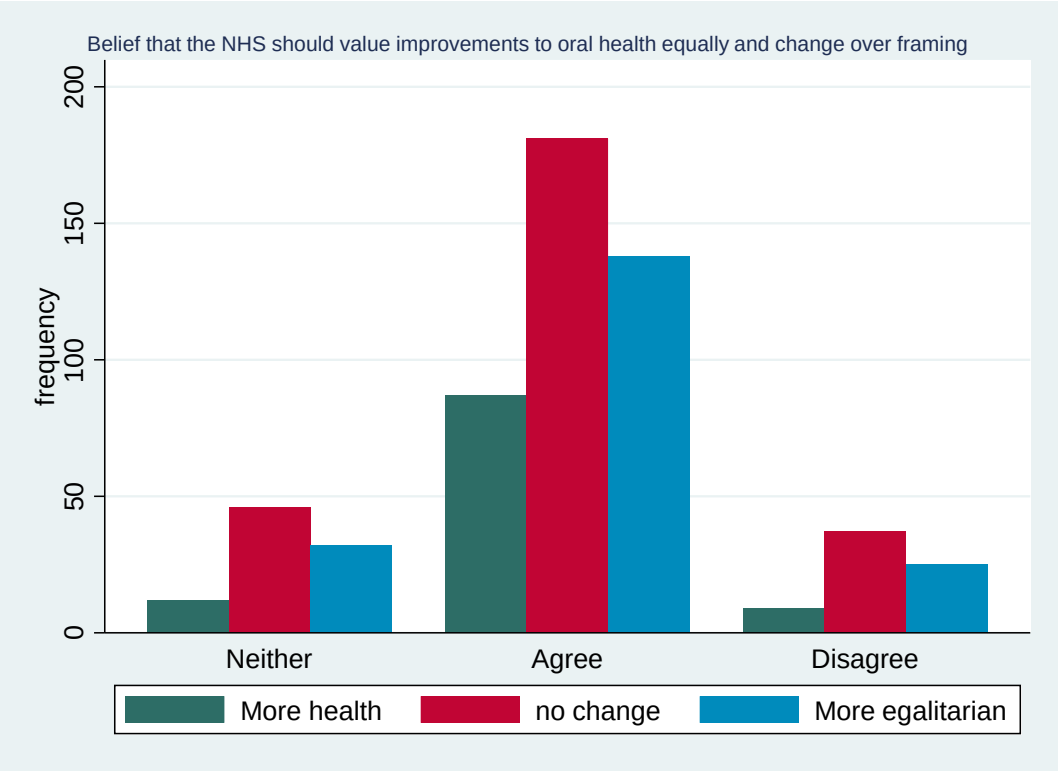

Figure 6.15: Attitudes toward the NHS valuing oral health improvements equally and change over framing

The next section derives the appropriate value of α (the weighting to use which accounts for non-health preferences) to use for the HRSWF.

Solving for alpha

Given the point of indifference between Programme A, Programme B, and the inequality aversion parameter are known, using eq. 4 we can now solve for alpha (α) which will identify the weightings between groups:

$$[\alpha(67)^{-1.02} + (1-\alpha)(81)^{-1.02}]^{-\frac{1}{1.02}} = [\alpha(69.5)^{-1.02} + (1-\alpha)(77)^{-1.02}]^{-\frac{1}{1.02}}$$

$$\alpha = 0.54$$

MRSS

Using eq. 2, we can now calculate the marginal rates of social substitution:

$$MRSS = \frac{0.54}{(1-0.54)}\left[\frac{((81+77)/2)}{((67+\ 69.5)/2)}\right]^{(1+1.02)}$$

$$MRSS = 1.58$$

In context, this means that improving the functioning dentition of those in the lowest socioeconomic group by one year is valued 1.58 times higher than those in the highest socioeconomic group.

6.7 Discussion

6.7.1 General discussion

This chapter has presented evidence regarding public preferences for inequality-efficiency trade-offs in oral health using a benefit trade-off exercise. The inequality aversion parameter in this exercise was 1.02 for the neutral framing and 2.21 for the socioeconomic framing. This means that participants are more averse to inequalities in functioning dentition when the inequality is presented according to socioeconomic status. The corresponding marginal rate of social substitution is 1.58, in context, this means that improving functioning dentition for those who are most deprived is worth 1.58 times more than those in the highest socioeconomic groups. In regard to the distributional judgements, a large percentage of respondents fell into the category of pro-rich or health maximising (over 50% for the neutral framing, but 43% for the socioeconomic). The 50th percentile for the neutral framing was therefore health maximising, whilst for the socioeconomic framing it was weighted prioritarian. The single largest category for both framings was weighted prioritarian.

Compared to previous studies in England these results suggest that the public in England are less willing to trade efficiency with inequality reduction in oral health than in general health. Whilst the inequality aversion parameter in this study was 1.02 for the neutral framing and 2.21 for the socioeconomics, previous studies in health have found inequality aversion parameters of above 10 using socioeconomic framings, and above 5.5 for neutral framings (McNamara, Tsuchiya and Holmes, 2021; Robson *et al.*, 2017). Similarly, previous research categorised the majority of respondents as weighted prioritarians or egalitarians (Abásolo and Tsuchiya, 2013; Robson *et al.*, 2017). There is however an alternative interpretation available: that the difference is not between health and oral health, but quantity and quality of life. Previous studies have mostly used life expectancy as their measure of inequality, which is a broad quantity of life measure whereas this study focuses on a specific component of quality of life – oral health. Although there is a limited body of evidence which uses a quality of life measure in a efficiency-inequality trade-offs the other studies which do draw comparisons seem to reflect what is found here: that inequality aversion is lesser when the inequality is regarding quality of life, not quantity (McNamara, Tsuchiya and Holmes, 2021).

Another factor which may contribute to the difference between the studies examining life expectancy and this result in oral health is the role of individual responsibility. As

is reflected in the qualitative data in Chapter 5 attitudes in England toward the role of the individual in relation to their oral health can be reductive: that it is the failing of the individual if they have poor oral health. If this is an underlying belief held by our sample, a representation of the general public in England, it may contribute to the difference between inequality aversion in life expectancy and inequality aversion in oral health. This would reflect what Dolan & Tsuchiya (2009) found that when an individual was thought to be in poor health as a result of their own actions (smoking), inequality aversion halved. However, the attitudinal statements in Table 6.14 indicate that for 54% of respondents they disagree that individuals are responsible for their own oral health, and 55% agree that the NHS should be focusing on reducing the difference between years of functioning dentition, even when it means sacrificing additional years functioning dentition elsewhere.

It is therefore interesting to reflect on what may be driving the difference between trade-off points for individuals. Figures 6.11 and 6.12 show how the functioning dentition of the participant and the use of dental services impact the responses. Interestingly there is little difference in how people respond according to whether or not they have their functioning dentition, with a more pronounced difference between those who use private or NHS dental services – with those who depend on NHS dental care more likely to focus on health maximisation. Again, when thinking about the possible cause of this difference it is useful to reflect on the qualitative data: participants who are answering these questions may be concerned about the consequences for their own access to services and would therefore prefer the option which focuses on maximising functioning dentition.

As this is the first study using a BTO applied to oral health it is important to reflect on some of the choices made – specifically on the measure of inequality used (functioning dentition) and the groups used to represent the inequality (the richest and poorest quintiles). Whilst sections 6.4.1 and 6.4.2 respectively offer justification of these choices, it is also worthwhile reflecting on how results could differ if another measure was chosen, defined according to different groups.

Whilst it is the quantity of life which proves to be significant in inequality aversion in health (when compared to pain and mobility), this may not hold true for oral health (McNamara, Tsuchiya and Holmes, 2021). Instead, it is possible that inequality aversion is stronger when related to oral pain than years of functioning dentition. The question of what matters when discussing inequality aversion is important and relates

back to Chapters 2 and 5 regarding how we define need in relation to oral health. Years of functioning dentition was chosen because it reflected both the NHS definition of clinically necessary and provided a baseline consistent with the views expressed in Chapter 5. However pain and function are not independent domains: if one has 20 teeth, one has also lost up to 12 teeth, which is unlikely to be a pain-free process. The use of functioning dentition therefore implies tooth-loss and associated pain but without explicitly outlining it, meaning it may not have factored into the participants decision. Using a measure which explicitly describes both function and pain associated with oral health status would be consistent with the NHS definition and the qualitative data in Chapter 5 and may yield different results. Pain as a topic was intentionally avoided in order to prevent introducing bias into results, as participants may reflect on their own experiences of dental pain and consequently their (un)willingness to sacrifice in order to avoid pain may be higher, and this in turn may detract from the societal perspective at the heart of the exercise. Future research however should carefully consider how they would like to present the inequality in oral health and consider a broader definition relating to quality of life.

The second consideration is who the inequality should be associated with. This study chose to use socioeconomic status as inequalities in oral health are prominent dependent on deprivation (Shen, Wildman and Steele, 2013). As both socioeconomic deciles as defined by IMD and functioning dentition were available in the 2009 ADHS this also meant the scenarios could be based in existing evidence and in the real-life inequality between these groups. The measure used to represent socioeconomic status was income, however IMD is only partly comprised by income and uses broader data such as employment and education as part of the composite so a different proxy could have been used such as education. Using education to describe the groups in the context of a BTO has yet to be done in health or oral health. Since previous studies have used wealth it allows for this comparison to be made – i.e. to determine if inequality aversion in health and oral health according to socioeconomic status are weighted differently. Whilst it is difficult to know what the impact of using education would be, it is possible to speculate. It may be that inequality aversion is higher if termed according to educational status, a reflection of empathy that those with poor oral health cannot, or should not, be held responsible for their oral health status as their education meant they did not know better. Conceptually this might be advantageous as it separates the groups from the idea of a meritocracy – the idea

that wealth is determined by effort as raised in Chapter 5. However, Chapter 5 also outlines the importance of the accessibility of dental care for those who cannot afford dental care otherwise. Ultimately income was also chosen because this is often the basis for exemptions in the context of healthcare systems – it is the poorest which are afforded free health and oral healthcare, and therefore using income as the proxy for socioeconomic status enables greater policy relevance.

This study also considers efficiency and inequality in isolation – the crux of the issue presented to respondents is that they are opposing objectives. The focus of the Programmes proposed are on efficiency *or* inequality reduction, and the scenarios are static. However, once a threshold of oral health is reached there can be diminishing returns – for example offering oral health improvements to those who retain their natural teeth and have minimal dental disease is likely to be costly with little return. It therefore follows that at a certain point, the efficient option and the inequality reduction are one and the same as although addressing oral health inequalities is costly, it also yields a larger potential return. This is beyond the scope of the current study but is important to consider as oral health is dynamic and the implication of the results found here should not be interpreted as efficiency for oral health services, exclusionary of those with the worst oral health, but efficiency inclusive of all groups in society.

This study also contributes to the evidence that framing the question neutrally or socioeconomically impacts the responses elicited, with participants shifting away from pro-rich and health maximising distributional categories and into weighted prioritarians, maximin and egalitarian categories when the question is posed using a socioeconomic framing. This is despite the majority (72%) of respondents agreeing with the statement that the NHS should value improvements to everyone's oral health equally. This evidence indicates that there is non-health rationale contributing to responses in the socioeconomic framing, and therefore HRSWFs which rely on a anonymity should not be used with a socioeconomic framing, as non-health rationale may bias the result. This reflects findings from other studies and raises questions regarding what the inequality aversion parameter has captured in studies which have used differences in health alongside differences in socioeconomic status (McNamara, Tsuchiya and Holmes, 2021; Robson, O'Donnell and Van Ourti, 2024). The findings here indicate that these are likely to capture both inequality aversion in health, and a degree of compensation for socioeconomic status.

6.7.2 Policy Implications

This is the first piece of quantitative work to consider inequality aversion in relation to oral health in England from the perspective of members of the public. As such, it provides valuable insight into how contract reform should be orientated with respects to oral health, efficiency and inequalities. The results indicate that the most common distributional judgement within society is weighted prioritarian, i.e. neither concerns with just efficiency, or just inequalities, should dominate decision making. This is in direct contradiction with recent developments in recent NHS dental service piloting, which has targeted the provision of NHS dental services to those who need the service the most – i.e. the socioeconomically deprived with the worst oral health, and in the context of the recovery plan for NHS dentistry, which does not consider oral health inequalities (Department of Health and Social Care and NHS England, 2024; NHS Cornwall and Isles of Scilly, 2023). The recovery plan will be discussed fully in Chapter 8.

The other potential use for these results is within DCEA. This study has generate inequality aversion parameters ranging from 1.02-2.21 which can be used for future economic evaluation for oral health interventions, particularly when they concern oral health improvements for those with the worst oral health. This is a useful contribution to the literature and the evidence base for dentistry continues to grow. Due to the unique nature of each economic evaluation it is not appropriate to approximate a result using the inequality aversion parameters found here as DCEAs also depend on the parameters and assumptions on the underlying models, but considering another study can provide some context. A study which considered different strategies for bowel cancer screening (universal or targeted) found that an inequality aversion parameter of 7 or above switches the highest yield in terms of societal welfare from universal reminders to targeted reminders (Asaria, Griffin and Cookson, 2016). The inequality aversion parameters of 1.02 or 2.21 as found in this study would therefore be insufficient to recommend a targeted screening strategy which prioritises those living in deprived areas. At this juncture is not possible to what impact an inequality aversion parameter of 1.02 or 2.21 means for an DCEA in oral health as the models are dependent on context and, in the case of DCEA, other assumptions need to be made – such as the sources of fair and unfair inequality – but it can be said that other studies have required a larger inequality aversion parameter in order to prioritise the intervention which would target those in deprived areas.

6.7.3 Strengths and limitations

This study is the first to examine an efficiency-inequality trade-off in oral health using a quantitative preference elicitation framework. The importance of investigating the issue quantitatively is not to be underestimated – qualitative methods offer useful insight into the breadth of issues but may not accurately represent the intensity of preferences when opportunity costs are involved. Consequently, the evidence presented here is critical to building understanding about what members of the public in England believe should be prioritised in a national dental service when faced with constraints. This is not only a strength in isolation but is particularly relevant considering the climate of NHS dentistry in England.

As this is the first inequality-efficiency trade-off to be conducted in oral health globally it offers a significant and valuable contribution to the field. It provides a framework for future investigations into efficiency-inequality trade-offs in oral health and can be used to investigate the same issue in other countries seeking to establish what societal values their national oral health service should reflect, or provide a starting point for others wishing to investigate efficiency-inequality trade-offs in relation to different aspects of oral health, such as using a quality of life measure like the Oral Health Impacts Profile-14 (OHIP-14), or investigating a different inequality, such as the one between different ethnic groups.

A potential issue with this preference elicitation exercise is the potential impact of life expectancy. For those in the better-off group, in Programme A, retaining functioning dentition for 81 years is close to saying participants will retain functioning dentition for their entire lives. This could amplify the stakes of the trade-off (improving oral health for the worse off group, vs giving a lifetime of functioning dentition to the better off group). This was considered prior to the piloting stages, and those who were involved with the think-aloud pilots were asked about whether or not this impacted their responses. These participants said they hadn't considered it as a factor, although it is not possible to confidently say this extends to the entire sample and this could be a factor in the large proportion of responses are pro-rich or health maximisers when compared with other studies (however, it does not explain why the responses are pro-rich as opposed to health maximisers). Related to this, there is the issue of how oral health is dynamic. The data used as the basis for the scenarios was collected in 2009, and with those losing functioning dentition at 61 would have been born in 1948. As outlined in Chapter 2 the oral health status of the nation can change rapidly, and

those who are born in 2024 should expect to keep their natural teeth for longer than someone born in 1948. Whilst this is potentially problematic it is not considered a significant issue as the general public awareness regarding what to expect from their oral health is generally low – i.e. it is unlikely a large amount of participants would know about functioning dentition prior to the survey, and similarly would be unaware of how many years of functioning dentition the general public can expect. The starting years of functioning dentition was not raised in the think-aloud piloting or online piloting as a number which seemed low to participants.

A common concern with preference elicitation surveys – particularly ones which have the potential to be length and therefore create a time burden on the participant – is the engagement with the survey itself. Figure 6.14 offers a degree of validity to the survey and indicates that participants have engaged with the material as 34% of respondents pick a more egalitarian option. In terms of survey design, what this means is that respondents reach their indifference later in their survey, i.e. not the quickest pathway out of the survey. This is not to say that the remaining 66% are picking the options which will conclude the survey the quickest – as the same response does not mean they reached indifference at the first scenario – but offers an encouraging metric that participants are reading and considering the question at hand. Some may also critique that there was no dominance question included: this was considered, however given the nature of the trade-off it was unclear what a dominant scenario in this context would constitute. It was therefore considered to be sufficient to include the tick-boxes asking participants to confirm if they had read and understood the questions, and that participants who moved quickly off the page would get prompted that it is important to read and consider the information.

This questionnaire has taken a slightly different format to its predecessors, which have relied heavily on graphical representations of the inequality data (for example Ali *et al.,* (2017), Dolan and Tsuchiya (2011), and Robson *et al.,* (2017)). Although both options were developed, a decision was made following informal feedback to use the table format. The feedback from the think-aloud interviews offered support that this was an easy to understand format for participants, but it should be acknowledged that some may have found the information more difficult to understand in this presentation. Other studies have also introduced the participants to the distributional judgements prior to the preference elicitation exercise using a video (Cookson *et al.*, 2018). Again, a choice was made early on not to do this as it was the

intention to elicit preferences without participants aiming for a certain categorisation of response – or wanting to avoid others. Whilst other studies have required participants to answer all scenarios, a decision was made not to make participants answer all possible scenarios to reduce the burden and choice fatigue as they were required to complete two choice sets (which would mean 14 scenarios).

It's important to also note the potential impact of the starting point. The study reported in this chapter follows the conventional starting point and subsequent ordering used by BTO exercises, presenting respondents with the most efficient option first. This will not be discussed further here, as the next chapter will explore alternative starting points and their (lack of) impact on results.

6.8 Chapter Summary

This chapter has outlined a key issue facing NHS dental health priority setting and consequently contract reform: whether oral health inequality reduction, or the oral health of the nation, should be prioritised. Using a public perspective the issue of how to prioritise these two objectives was investigated quantitatively, applying the methodology of a BTO to oral health for the first time to determine if – and the extent to which – inequality aversion exists for years of functioning dentition in England. The process determined that who the inequality affects impacts valuation and determined the inequality aversion parameter to be 1.02 for the neutral framing, 2.21 for the socioeconomic framing and a marginal rate of social substitution of 1.58 meaning an additional year of functioning dentition is worth 1.58 times more to the poorest group relative to the richest group. Whilst the 50th percentile respondent fell into the health maximiser category for the neutral framing, it was weighted prioritarian for the socioeconomic. However, the largest single distributional judgement category for both framings was a weighted prioritarian. This means that neither the objective of efficiency or inequality reduction should dominate the policy-making landscape, and balance needs to be sought between the two objectives to satisfy public preferences.

Chapter 7:Starting points and inequality aversion: a methodological investigation

7.1 Introduction

The previous chapter has demonstrated the structure and content of an efficiency-inequality trade-off using a Benefit Trade-Off framework (BTO) in oral health and presented findings replicating the starting point and ordering most frequently used in these exercises: presenting the respondents with the most efficient (i.e. the largest oral health gains) option first and decreasing the efficiency as the scenarios progress (as demonstrated in figure 6.4). As part of the investigation into the existence – or lack thereof – of inequality aversion in oral health a methodological investigation was conducted alongside the preference elicitation exercise presented in Chapter 6. The methodological component examines if the scenario presented first (the starting point) impacts the indifference point of respondents. The starting point presented in Chapter 6 – which is a third of the total sample available and will be referred to as the efficient starting point – is compared to two other starting points: an inverted starting point, which presents the least efficient and most egalitarian option first, and a random starting point.

The potential impact of the starting point in a BTO, and the ordering of scenarios in the preference elicitation exercise has raised by other authors as a source of concern. Olsen (2004) notes that from the perspective of the respondent there is a temptation to pick one Programme, and 'stick' with the choice as the exercise progresses as the exercise may be too abstract and cognitively demanding for respondents to engage with. Abásolo & Tsuchiya (2013) hypothesise that by presenting respondents with a programme which decreases incrementally participants may be 'lulled' into a response which is non-monotonic, meaning participants prefer egalitarian options where the health gain to both groups is lower. In their study they therefore offer a random ordering of scenarios but find that the random ordering does not offer a statistically significant change in indifference point (Abásolo and Tsuchiya, 2013). Looking further than the BTO literature, behavioural economics discusses the impact of anchoring and adjustment and endowment effects in other preference elicitation exercises, both underpinned by the simple notion that where you start, or what you start with, will impact what is acceptable at a later stage (Thaler, 1980; Tversky and Kahneman, 1974). The body of evidence with regard to starting point and inequality aversion is therefore slim and warrants further investigation.

The aim of this chapter is to build on existing evidence by offering alternative starting points, with one which inverts the usual scenario ordering (and instead presents the least efficient – or most egalitarian – scenario first) and another which randomises the starting point. Using these alternative starting points, the distributional judgements, inequality aversion parameters and MRSS will be evaluated to establish if the outputs from the BTO can be influenced by starting point, and consequently if there are potential biases which need to be assessed, and controlled for, during the construction of a BTO to ensure robust results. Specifically, there is a risk that when presenting the largest health gain first participants may create an endowment effect and participants may be unwilling to trade (i.e. their reference point is the starting Programme B, and will focus on the decrease of efficiency within Programme B instead of comparing across to Programme A). During the think-aloud piloting described in section 6.5.2, this did not appear to be a concern however during the online piloting the initial dataset indicated that this could be an issue. The aim of this chapter is therefore to test one central hypothesis: if the scenario respondents are presented with first impacts their indifference point in a BTO exercise.

7.2 Methods

Alongside the data and starting point described in Chapter 6, which starts participants with the most efficient scenario – scenario 1 – and moves sequentially to least efficient scenario – scenario 7 – two alternative starting points were used for the preference elicitation exercise. One which inverts the ordering of scenarios, starting participants with the least efficient and most egalitarian scenario – scenario 7 – and one which randomises the starting point. These will be described in more detail shortly in section 7.2.1, but it is important to note that these alternate starting points only impact the order of the scenarios for the preference elicitation exercise. The remaining study design remains the same, as presented in figure 7.1:

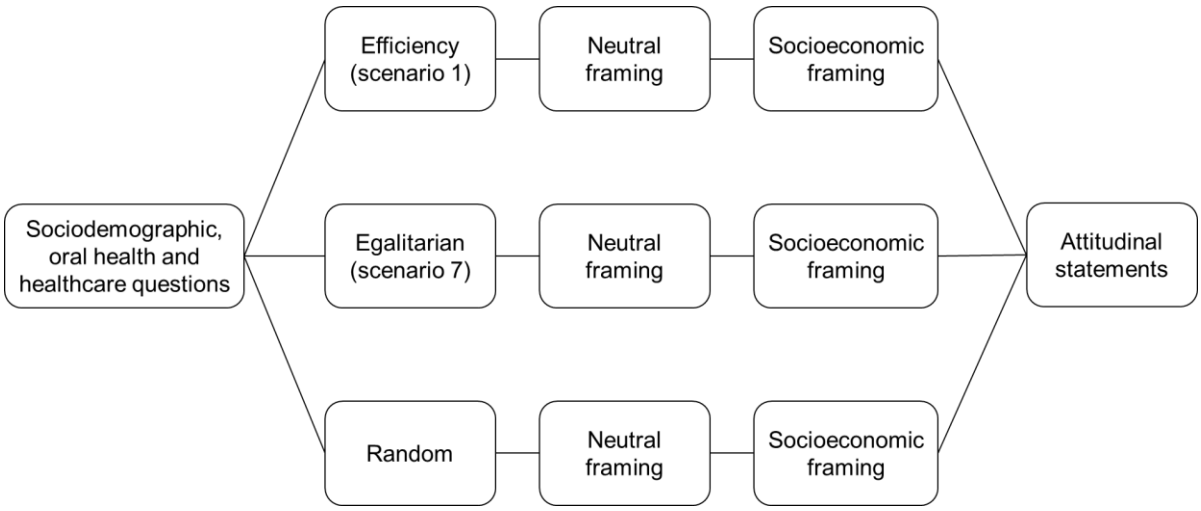

Figure 7.1: study design for methodological testing

The outputs for comparison across arms therefore remain the same as the previous chapter, with distributional judgements, inequality aversion parameters and MRSS derived for each starting point. The analysis also includes the response to the first scenario seen, and how this compares across starting points, and the change in indifference point over framing (meaning the neutral frame and the socioeconomic frame). The next sections describe the alternative starting points, and the implications for analysis.

7.2.1 Alternative starting point: egalitarian

The egalitarian starting point inverts the order of the scenarios which are presented to respondents, starting with the lowest health gain to the worse-off group in Programme B, i.e. the most extreme egalitarian option offered to respondents. This option offers a lower total oral health gain, and a lower oral health gain to the worst-off than Programme A, but Programme A is not considered dominant because the increase in inequality is lower in Programme B than Programme A – Programme B is a logical choice, if the participant cares only about inequality reduction. This response is considered non-monotonic, but logical because it still offers the lowest increase in inequality. Consequently, this starting point is called egalitarian. Table 7.1 provides the trade-off presented first to those randomised to the egalitarian starting point, using a neutral framing:

	SCENARIO 7 (seen first in the egalitarian starting point)					
	Programme A			Programme B		
	Functioning dentition			Functioning dentition		
	Before the programme	After the programme	Gain	Before the programme	After the programme	Gain
People with the **worst** oral health	64 years	67 years	3 years	64 years	65 years	1 year
People with the **best** oral health	74 years	81 years	7 years	74 years	77 years	3 years
Total health gain	10 years			4 years		
Inequality	Increases by 4 years			Increases by 2 years		

Table 7.1: Starting scenario for egalitarian first starting point

For this starting point, if the participant picks Programme B or states they are equally happy with the two programmes there are no further choices. This is because the participant starts at scenario 7, and there are no further increments in which Programme B decreases. However, if they pick Programme A, they will face a subsequent choice where Programme B increases the health gain to the worse-off group by one, i.e. they will move to scenario 6. This pattern continues until the participant states they are equally happy with both options, they switch to Programme B or they reach Scenario one. This pathway is presented in figure 7.2:

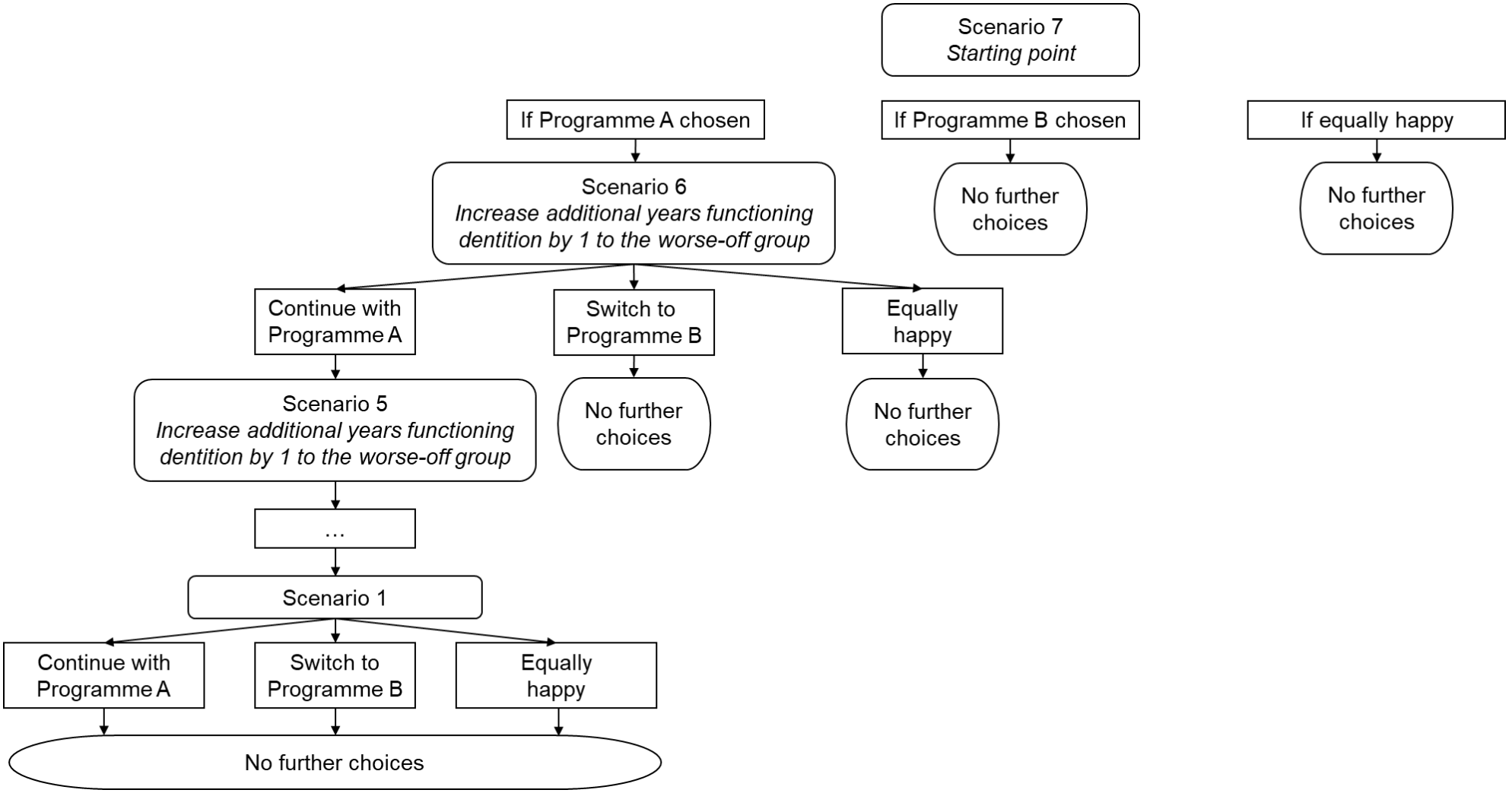

Figure 7.2: progression pathway for egalitarian starting point

7.2.2 Alternative starting point: random

The final starting point, random, allocates participants to one of the seven scenarios as their starting scenario. The subsequent ordering of scenarios depends on the answer of the participant: if they prefer Programme B, the pathway will reflect the efficient starting point and the next option will decrease the years of functioning dentition to the worse-off group by one. However if they prefer Programme A, the pathway will reflect the egalitarian and Programme B will increase the years of functioning dentition to the worse-off group by one. If their initial response is equally happy however, there are no subsequent choices. This is displayed in figure 7.3, using a participant randomised to scenario 4 as an example:

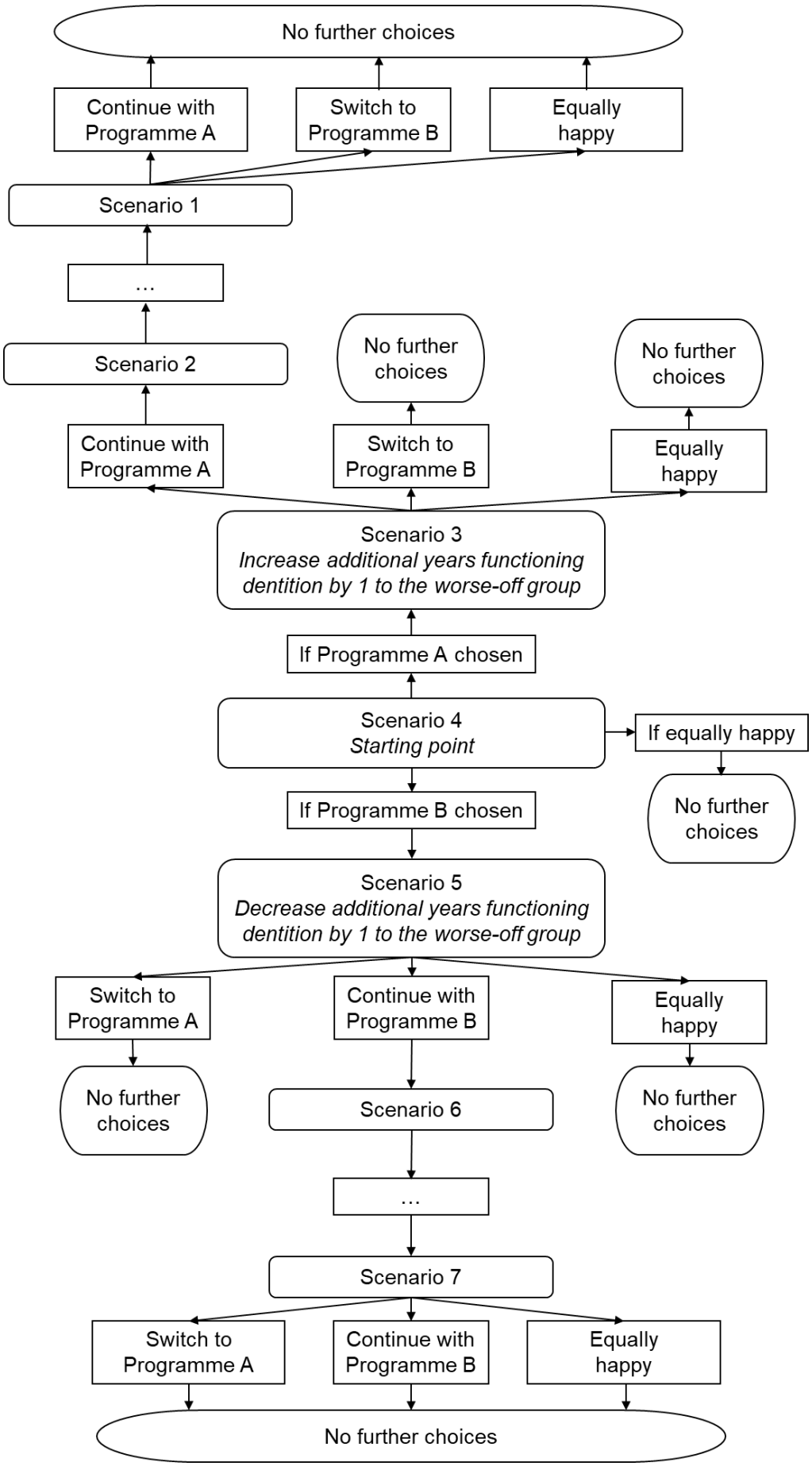

Figure 7.3: Response pathways for random starting point

7.2.3 Indifference pairings for analysis

As the egalitarian starting point inverts the scenarios, and depends on a participant picking Programme A in order to progress to the next scenario, this is reflected in the values used for the analysis (i.e. they are the same as in Table 6.10 in the Chapter 6, but the order is inverted). This is displayed in Table 7.2. For the random starting point, the values used for analysis will depend on if the participants pick Programme A (and reflect the scenario ordering for the egalitarian starting point egalitarian) or Programme B (and reflect the scenario ordering for the efficient starting point).

Scenario	Exercise progression	Response order	Category	Indifferent between			
				Programme A		Programme B	
				Best (wealthiest) $U_J(A)$	Worst (poorest) $U_K(A)$	Best (wealthiest) $U_J(B)$	Worst (poorest) $U_K(B)$
7 *Egalitarian starting point*	No further choices	BBBBBBB	Egalitarian	81	67	77	64.5
	No further choices	=BBBBBB		81	67	77	65
	Move to scenario 6	ABBBBBB		81	67	77	65.5
6	No further choices	A=BBBBB		81	67	77	66
	Move to scenario 5	AABBBBB		81	67	77	66.5
5	No further choices	AA=BBBB	Maximin	81	67	77	67
	Move to scenario 4	AAABBBB	Weighted prioritarian	81	67	77	67.5
4	No further choices	AAA=BBB		81	67	77	68
	Move to scenario 3	AAAABBB		81	67	77	68.5

3	No further choices	AAAA=BB		81	67	77	69
	Move to scenario 2	AAAAABB		81	67	77	69.5
2	No further choices	AAAAA=B		81	67	77	70
	Move to scenario 1	AAAAAAB		81	67	77	70.5
1	No further choices	AAAAAA=	Health maximiser	81	67	77	71
	No further choices	AAAAAAA	Pro-rich	81	67	77	71.5

Table 7.2: Scenarios and indifference points for egalitarian starting point

7.3 Results

A total of 1,688 participants were recruited. As reported in the previous chapter 577 were randomised to the efficient starting point for the previous analysis. For the alternative starting points used in the methodological study, 580 were randomised to the egalitarian starting point and the final 531 were randomised to the random starting point.

7.3.1 Descriptive Statistics

Table 7.3 shows some of the key socio-demographic characteristics of the sample with percentages within parenthesis.

Demographic	Starting point			Whole sample
	Efficient (n=577)	Egalitarian (n=580)	Random (n=531)	Total (n=1,688)
Sex				
Female	323 (55.98)	315 (54.31)	299 (56.31)	937 (55.51)
Age				
18-29	40 (6.93)	53 (9.14)	31 (5.84)	124 (7.35)
30-39	99 (17.16)	87 (15.00)	79 (14.88)	265 (15.70)
40-49	100 (17.33)	100 (17.24)	96 (18.08)	296 (17.54)
50-59	105 (18.20)	128 (22.07)	85 (16.01)	318 (18.84)
60-69	109 (18.89)	94 (16.21)	116 (21.85)	319 (18.90)
70+	123 (21.32)	116 (20.00)	124 (23.35)	363 (21.50)
Education				
Degree or equivalent and above	264 (45.75)	276 (47.59)	240 (45.20)	780 (46.21)
A levels or equivalent	103	102	115	320

	(17.85)	(17.59)	(21.66)	(18.96)
Other qualifications below A levels or equivalent	145 (25.13)	145 (25.00)	121 (22.79)	411 (24.35)
Other (including no qualifications)	65 (11.26)	57 (9.82)	55 (10.36)	177 (10.49)
Latest main economic activity				
Paid work	299 (51.82)	310 (53.45)	260 (48.96)	869 (51.48)
Unemployed	10 (1.73)	11 (1.90)	22 (4.14)	43 (2.55)
Retired	142 (24.61)	141 (24.31)	149 (28.06)	432 (25.59)
Other/not provided	126 (21.83)	118 (20.34)	100 (18.83)	344 (20.38)
Household income				
£1,410 or less pm	102 (17.68)	99 (17.07)	97 (18.27)	298 (17.65)
£1,411 - £2,560 pm	150 (26.00)	125 (21.55)	105 (19.77)	380 (22.51)
£2,561 - £4,350 pm	146 (25.30)	178 (30.69)	139 (26.18)	463 (27.43)
£4,351 or more pm	158 (27.38)	156 (26.90)	180 (33.90)	494 (29.27)
Not provided	21 (3.64)	22 (3.79)	10 (1.89)	53 (3.14)
Ethnicity				
White British	472 (81.80)	483 (83.28)	451 (84.93)	1406 (83.29)
Other	105 (18.20)	97 (16.72)	70 (15.06)	282 (16.71)

Table 7.3: sociodemographics of methodological testing sample

The total sample size for the random starting point is slightly lower than for the other starting points. The overall balance of the demographics within the sample has a reasonable balance, however the youngest age bracket, 18-29, and those aged 50-

59 are comparatively over-represented in the egalitarian starting point. The efficient starting point has a larger proportion of participants who do not identify as ethnically white British, whilst those in the random arm have slightly less people in paid work, with more unemployed or retired. However, the random starting point does have more people claiming to be in the highest income bracket compared to the efficient and egalitarian starting point.

7.3.2 Health and oral health related frequencies

Table 7.4 shows the health and oral health related status of the participants.

	Starting point			Whole sample
	Efficient	Egalitarian	Random	Total
Respondents with a long-standing health condition	203 (35.19)	198 (34.14)	187 (35.21)	588 (34.83)
Dental health				
Good	328 (56.84)	335 (57.75)	300 (56.49)	963 (57.05)
Fair	183 (31.72)	185 (31.90)	173 (32.58)	541 (32.05)
Bad	66 (11.44)	60 (10.34)	58 (10.92)	184 (10.90)
Respondents with functioning dentition	447 (77.47)	471 (81.21)	426 (80.23)	1344 (79.62)
Dental attendance				
Regular (1 or more times every 2 years)	441 (76.43)	439 (75.69)	393 (74.01)	1273 (75.41)
Irregular	130 (22.53)	50 (22.76)	46 (23.92)	147 (23.05)
Type of service used				
Private dental care	181 (31.37)	167 (28.79)	158 (29.76)	506 (29.98)
NHS dental care that you paid for	291 (50.43)	307 (52.93)	257 (48.40)	855 (50.65)

NHS dental care that was free	71 (12.31)	67 (11.55)	76 (14.31)	214 (12.68)

Table 7.4: oral health and dentistry useage of methodological sample

The sample has a reasonable distribution between starting points of the health and oral health related variables. Slightly less people have functioning dentition in the efficiency first starting point, whilst the random arm has a slightly larger number of people who receive free NHS dental care. The egalitarian staring point has less people who use private dental care, but more who use paid for NHS care relative to the other two starting points.

7.3.3 Attitudinal statements

For brevity, table 7.5 displays the attitudinal statements by starting point which were used for analysis in the previous chapter.

Statement		Starting point			
		Efficient	Egalitarian	Random	Whole sample
The NHS should try and reduce the functioning dentition gap between poorer and wealthier people, even if this means average years of functioning dentition in the overall population will be lower.	Agree	318 (55.11)	261 (45.00)	255 (48.02)	834 (49.41)
	Neither	171 (29.64)	173 (29.83)	151 (28.44)	495 (29.32)
	Disagree	87 (15.08)	146 (25.17)	124 (23.36)	357 (21.15)
The NHS should not prioritise oral health. Individuals are responsible for their own oral health.	Agree	126 (21.84)	120 (20.69)	118 (22.22)	364 (21.56)
	Neither	137 (23.74)	113 (19.48)	120 (22.60)	370 (21.92)
	Disagree	314 (54.42)	347 (59.82)	293 (55.18)	954 (56.52)

Table 7.5: Attitudinal statements from methodological sample

Interestingly, less people randomised to the egalitarian starting point agree (and, more disagree) with the statement that the NHS should try to reduce the inequality in functioning dentition at the cost of efficiency. In the other attitudinal statement provided here, the egalitarian starting point respondents also disagree more frequently with the statement that the NHS should not prioritise oral health and that individuals are responsible for their own oral health.

7.3.4 Data analysis

The following section explores the impact of the starting point on results. As discussed in section 7.1, it was hypothesised that inequality aversion should be independent of the respondents starting point. The following data analysis will produce the same outputs as the previous chapter, meaning the distributional judgements, inequality aversion parameters and MRSS will be produced for the egalitarian and random starting points and compared to the findings from the previous chapter to identify if there is an observable difference between results. Additional evidence is then presented to demonstrate how responses change across the different starting point, and if the change in framing paired with the different starting point has a consistent effect on the indifference point.

Distributional judgements

Figure 7.4 shows how respondents fall into each of the distributional judgements over the different starting points:

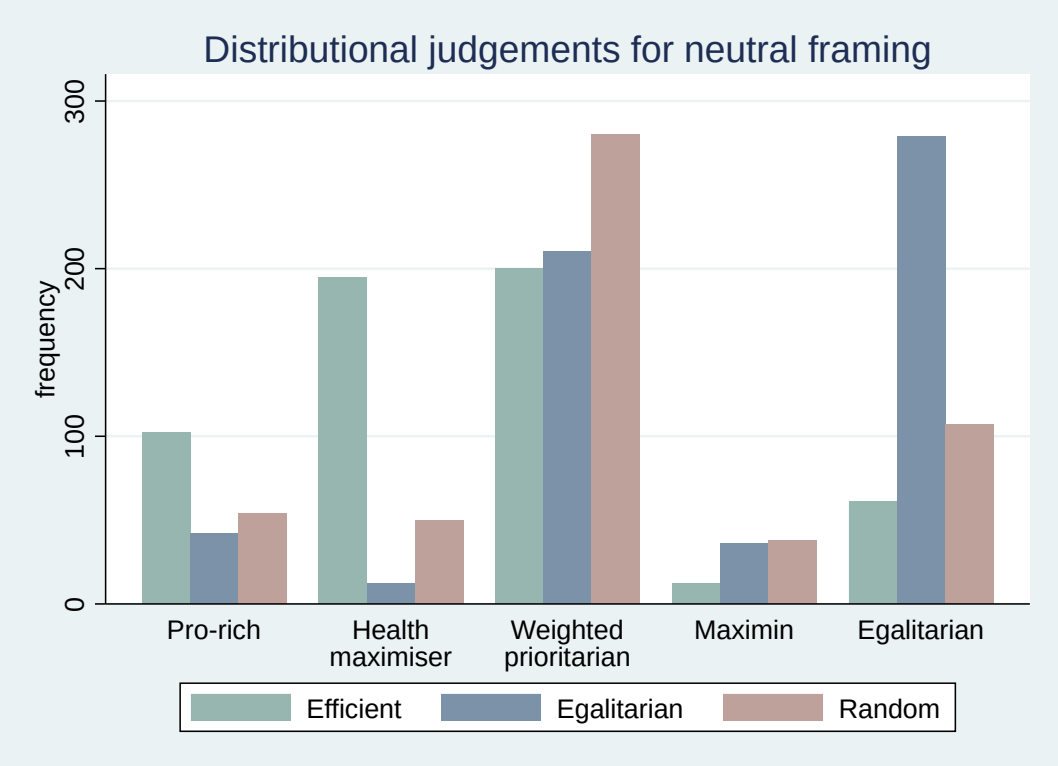

Figure 7.4: distributional judgements for the neutral framing for all starting points

Whilst the largest single group for the efficient starting point and the random starting point is weighted prioritarian (with 35% and 52.9% respectively), the largest group in the egalitarian starting point is egalitarian (48.2%), followed by weighted prioritarian (36.3%). The distribution of responses is also different, with respondents in the efficient starting point mostly falling into the pro-rich, health maximiser and weighted prioritarian categories, with those in the egalitarian first starting point falling more frequently into the egalitarian category. This is replicated in the socioeconomic framing, as shown in Figure 7.5:

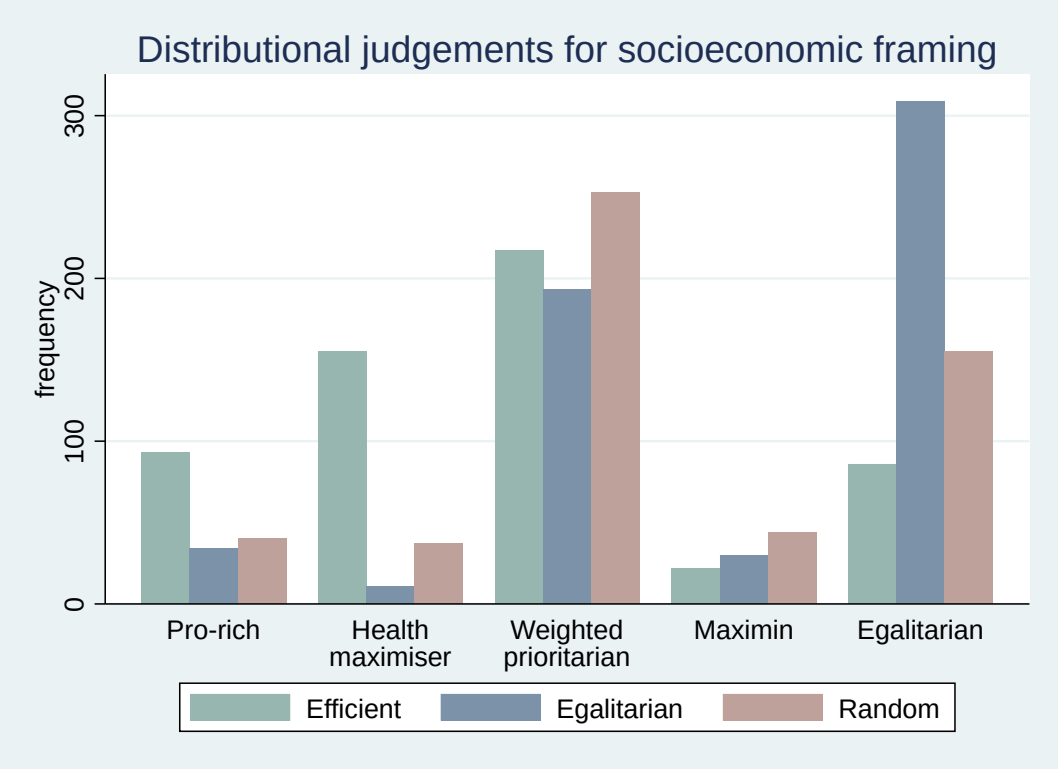

Figure 7.5: distributional judgements for the socioeconomic framing for all starting points

For the socioeconomic framing, the pattern of responses is similar however the weighted prioritarian category grows for the efficiency first starting point to 37.9%, whilst for the random starting point responses become more egalitarian (from 20.2% in the neutral framing, to 29.3% in the socioeconomic). The egalitarian category also grows for the efficiency first starting point (from 10.7% to 15%) and for the egalitarian first starting point (53.6%, from 48.2% in the previous framing). The following bar chart in figure 7.6 shows the shifting for these distributional judgements across framings, with a red line highlighting the median response:

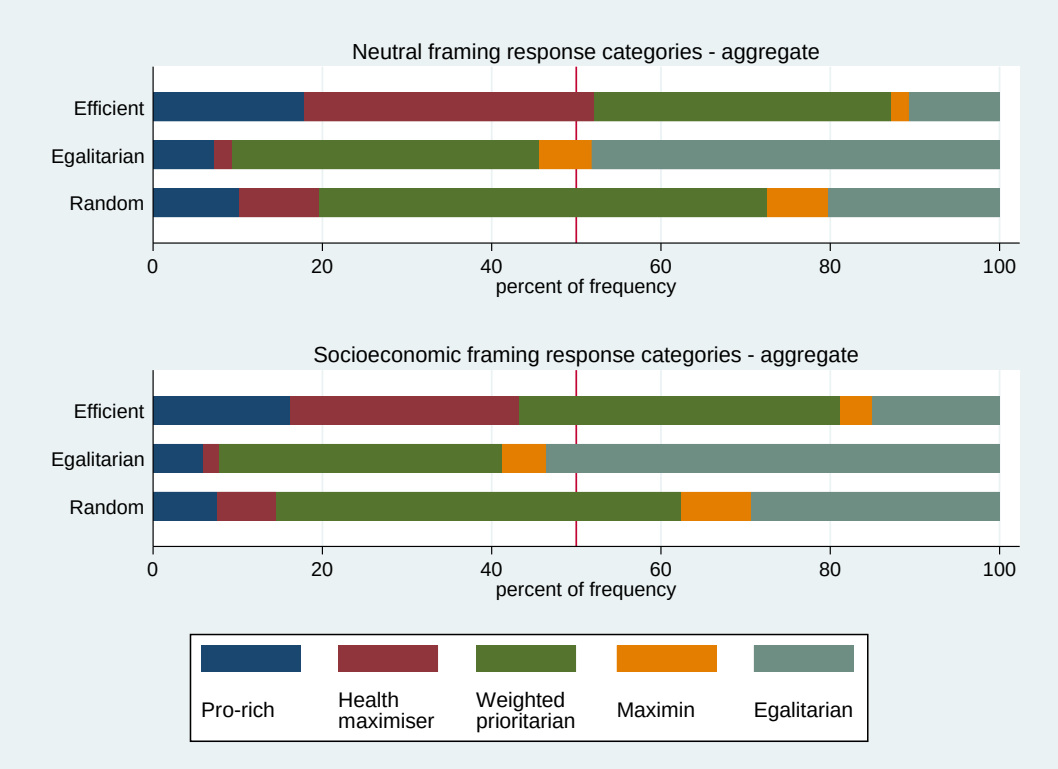

Figure 7.6: median responses for all starting points across the neutral and socioeconomic framings

These bar charts show how the 50th percentile respondent for each arm is different for each starting point in the neutral framing, with the efficiency first 50th percentile respondent being a health maximiser, whilst it is a maximin for the egalitarian first and a weighted prioritarian for the random. For the socioeconomic framing, the 50th percentile for efficient and random starting point are weighted prioritarian whilst the 50th percentile respondent is egalitarian for the egalitarian starting point. It is important to note however, that despite falling into the same distributional judgement – weighted prioritarian – this is a broad category covering several unique points used for analysis (as shown in table 7.2), and the median responses correspond to different analytical points for deriving the inequality aversion parameter in the next section.

Inequality aversion parameters

To calculate the inequality aversion parameter for the CES HRSWF, the median value is used from each of the three starting point samples. For each order the 50th percentile respondent is used to calculate the inequality aversion parameter for each starting point and each framing. These values are shown in Table 7.6:

	Parameter values for indifference point				Inequality aversion parameter r
	Neutral Framing				
	Programme A		Programme B		
Starting point	$U_J(A)$	$U_K(A)$	$U_J(B)$	$U_K(B)$	
Efficient	81	67	77	70	1.02
Egalitarian	81	67	77	67	Undefined
Random	81	67	77	68.5	5.38
	Socioeconomic framing				
	Programme A		Programme B		
Order	$U_J(A)$	$U_K(A)$	$U_J(B)$	$U_K(B_S)$	
Efficient	81	67	77	69.5	2.21
Egalitarian	81	67	77	66.5	Undefined
Random	81	67	77	67.5	11.91

Table 7.6: inequality aversion parameters for each starting point

In context, for the neutral framing this means the median respondent is indifferent between Programme A where those in the better-off group have 81 years of functioning dentition, and those in the worse-off group have a functioning dentition of 67 years, and Programme B where those in the better-off group have a 77 years of functioning dentition, and those in the worse-off group have a functioning dentition of 67 years for the egalitarian starting point. This increases to 68.5 years functioning dentition in Programme B for the worse-off group for the random starting point. The corresponding inequality aversion parameters are therefore 5.38 in the neutral framing, and 11.91 in the socioeconomic. Here, the inequality aversion parameter for arm 2 cannot be estimated using the CES HRSWF as the inequality aversion produces a negative denominator, which cannot be transformed logarithmically and, using the CES HRSWF implies inequality aversion is infinite (Abásolo and Tsuchiya, 2004)**.**

Following the process outlined in 6.3.4, weighting to be used should be 0.74 $(\alpha = 0.74)$ for the random starting point. This was 0.54 using the efficient starting

point. Again, an alpha value cannot be derived for the egalitarian starting point given the extreme inequality aversion. Consequently, a MRSS cannot be derived either

The MRSS for the random starting point was 7.95. In context, this means that given the starting points of 74 and 64 years of functioning dentition, in the random starting point improving the functioning dentition of those in the lowest socioeconomic group by one year is valued 7.95 times higher than those in the highest socioeconomic group. For the efficient starting point, this was 1.58.

Response to the first scenario seen

The response to the first scenario seen is simply considers whether participants see more than their starting scenario, which helps distinguish between participants 'speed running' the exercise (i.e. picking the options which will lead the participants out of the exercise the quickest) and those making considered decisions. Before presenting the results it is important to reflect that the quickest way out of the exercise is different according to which starting point respondents are randomised to: participants allocated to the efficient starting point will see no further choices if they pick Programme A or equally happy first, whilst those who start with the egalitarian options first will see no further choices if they pick Programme B or equally happy first. For those with the random starting point, if they are randomised between scenarios 2 and 6 they will always see a subsequent choice if they pick one of the Programmes. They see no further choices if they immediately pick equally happy, and the pathway reflects that of the efficiency first if they are randomised to scenario 1, or egalitarian first if they are randomised to scenario 7. This can be seen diagrammatically in Figures 6.4, 7.2 and 7.3 respectively.

Given participants are randomly distributed across arms, if participants are choosing to exit the preference elicitation exercise as quickly as possible we would expect this number to be equal across all starting points and therefore independent of the starting point. Figure 7.7 shows how participants responded for the neutral framing, and Figure 7.8 shows this for the socioeconomic framing:

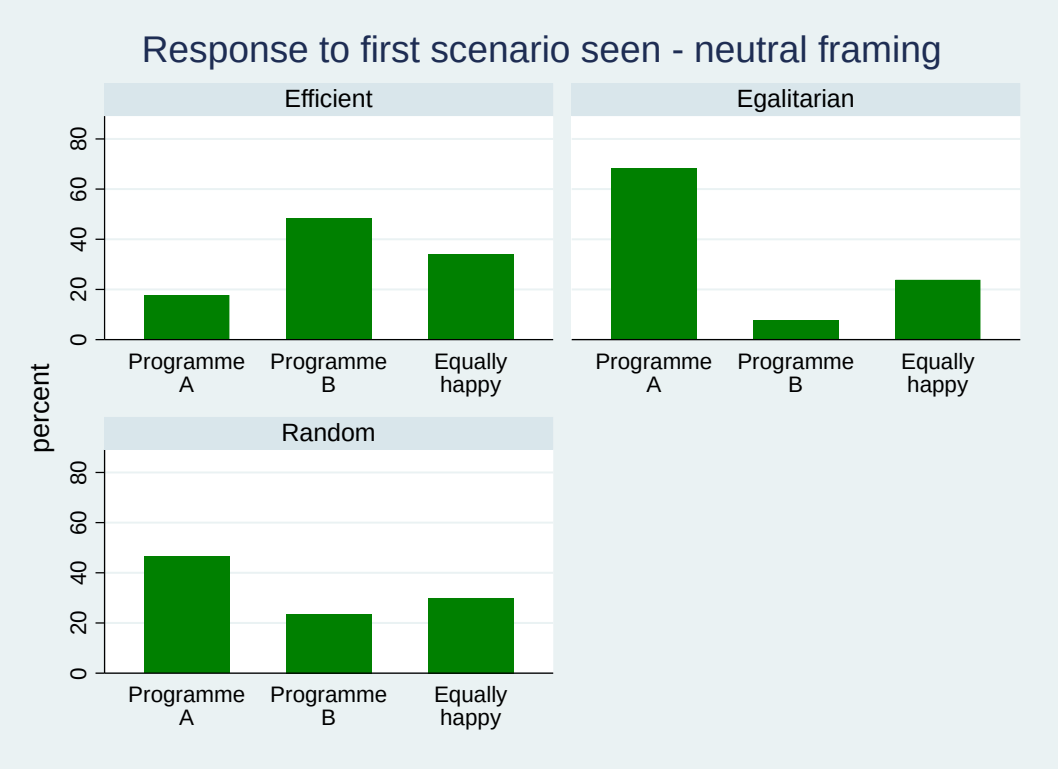

Figure 7.7: response to first scenario seen for neutral framing by starting point

As shown in Figure 7.7, 33.97% pick the equally happy choice in their first choice for the efficient starting point, whilst this figure is 23.83% for the egalitarian first and 29.98% for the random starting point. However, 17.77% of the sample in the efficient starting point also pick Programme A, meaning for the neutral framing over 50% of the sample never see a subsequent choice – i.e. they do not have the opportunity to trade. For the egalitarian starting point the percentage picking Programme B is 7.77%, and as 23.83% pick equally happy, the majority of the sample (around 68%) see more than one scenario. Similarly, around 70% of the sample for the random starting point see more than one scenario for the neutral framing, as 29.98% choose equally happy for the first scenario. The next figure, 7.8 shows the distribution for the socioeconomic framing:

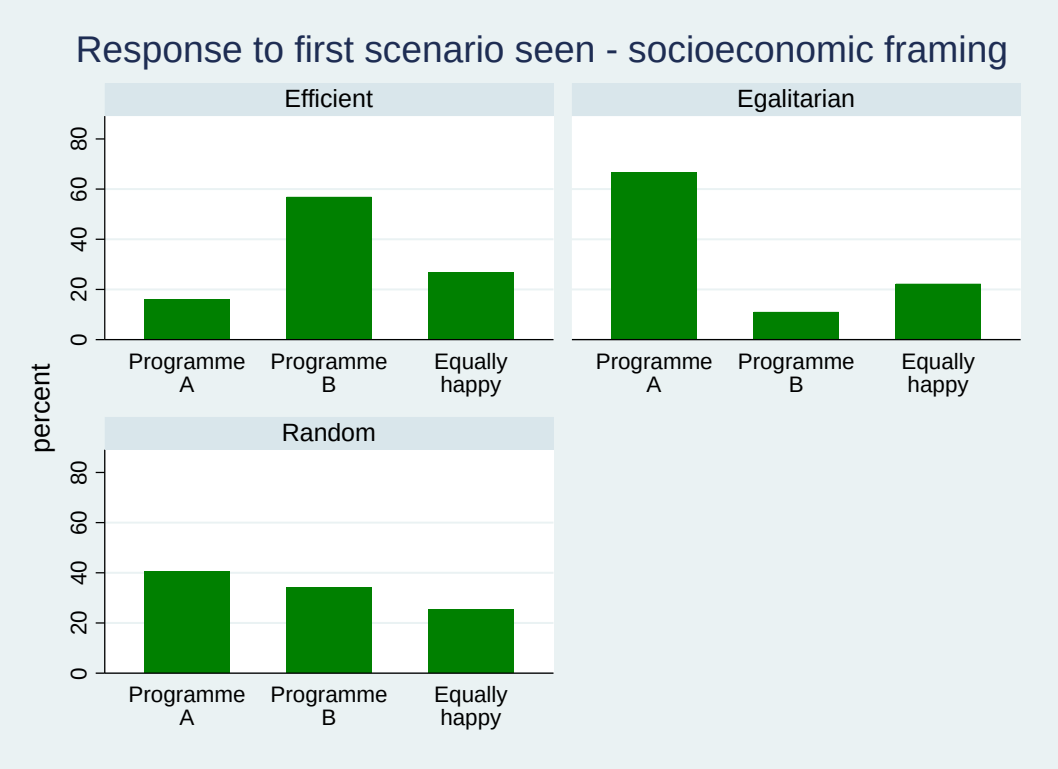

Figure 7.8: response to first scenario seen for socioeconomic framing by starting point

The number of people who are equally happy at the first scenario drops for all starting points, with 26.91%, 22.28% and 25.38% equally happy at the first scenario for the efficient, egalitarian and random starting point respectively. For the efficient starting point, the proportion of people who pick Programme A drops to 16.15% whist the proportion of people who pick Programme B for the egalitarian starting point increases to 11.05%. The next section will discuss the intuition of this and provide more in-depth analysis to the change which occurs over framing.

Change in indifference point over framing

As demonstrated in the previous chapter and in this chapter, specifically the analysis regarding distributional judgments, and in the response to the first scenario seen, the assumption of anonymity does not hold for this data, i.e. the responses at the aggregate level are different for those who are described as the 'poorest' and 'richest' in society when compared to those who have the 'worst' and 'best' oral health *ceteris paribus*. The change – or shift in responses over framings – can be visualised as shown in Figure 7.9:

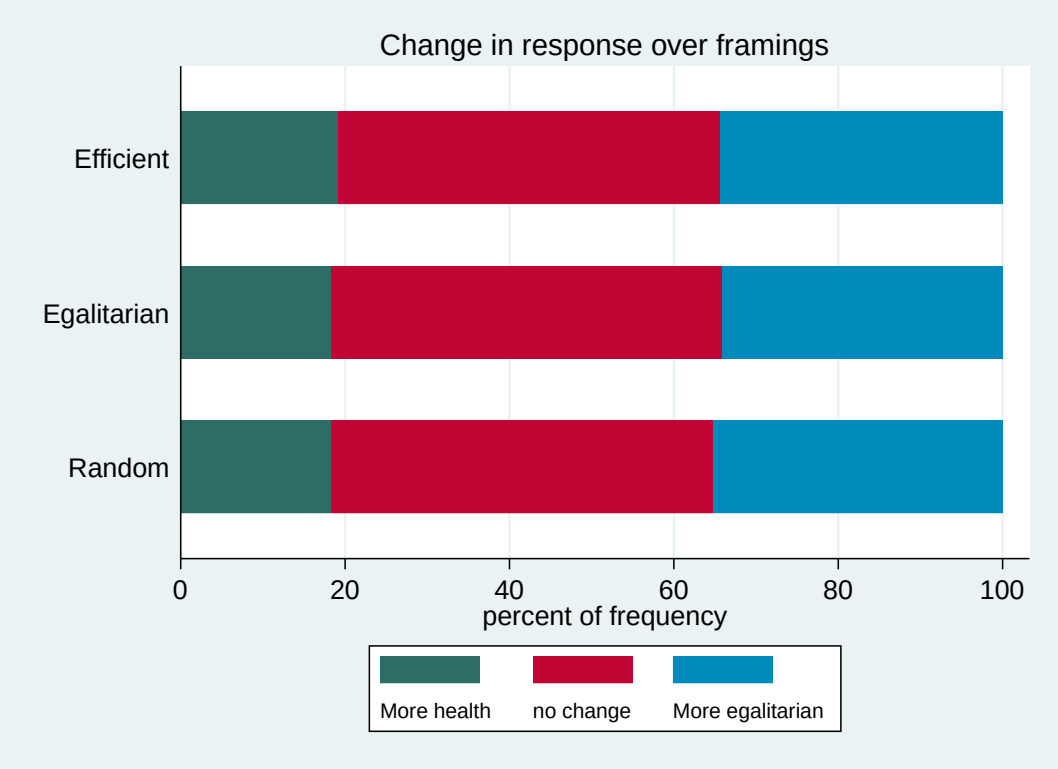

Figure 7.9: change in indifference point over framing for all starting points

Where ‘more health’ means participants change their indifference point to one which gives a higher total oral health gain relative to their previous choice, and more egalitarian means that their indifference point trades off oral health in order to reduce the inequality in functioning dentition. There is no change in response over framing for 46.47% of respondents start with the most efficient scenario, 47.48% for those who start with the most egalitarian scenario, and 46.40% for those who have a random starting point. For the efficient starting point 19.19% shift toward more health whilst the remaining 34.33% move toward a more egalitarian response. For those starting with the egalitarian scenario, 18.37% shift towards more health and 34.14% are more inequality averse, whilst for the random starting point this is 18.37% and 35.22% respectively. The similarity indicates that the changes which occur when the framings are altered are driven by exactly that: the framings, as opposed to an artefact of the starting point.

We can also observe how much the responses change over the framing for those who do have a change in their indifference point in .5 intervals of years functioning dentition. The interpretation is as follows: a 0.5 change means that a participants either changed their response from being indifferent between two scenarios to picking a Programme, or vice versa. For example, using the efficient starting point, a

+0.5 change would indicate their indifference point changed from previously picking equally happy to picking Programme A in the same scenario. For the egalitarian starting point, this change indicates a situation where a participant switches from Programme B to equally happy. A value of 1 or above indicates that participants have seen the next scenario in their sequencing before switching or reaching indifference.

The left-hand axis in Figure 7.10 represents the increase in additional years functioning dentition for the poorest group whilst Figure 7.11 represents the changes for participants who are willing to trade-off more years of functioning dentition to reduce inequalities when the scenarios are presented socioeconomically:

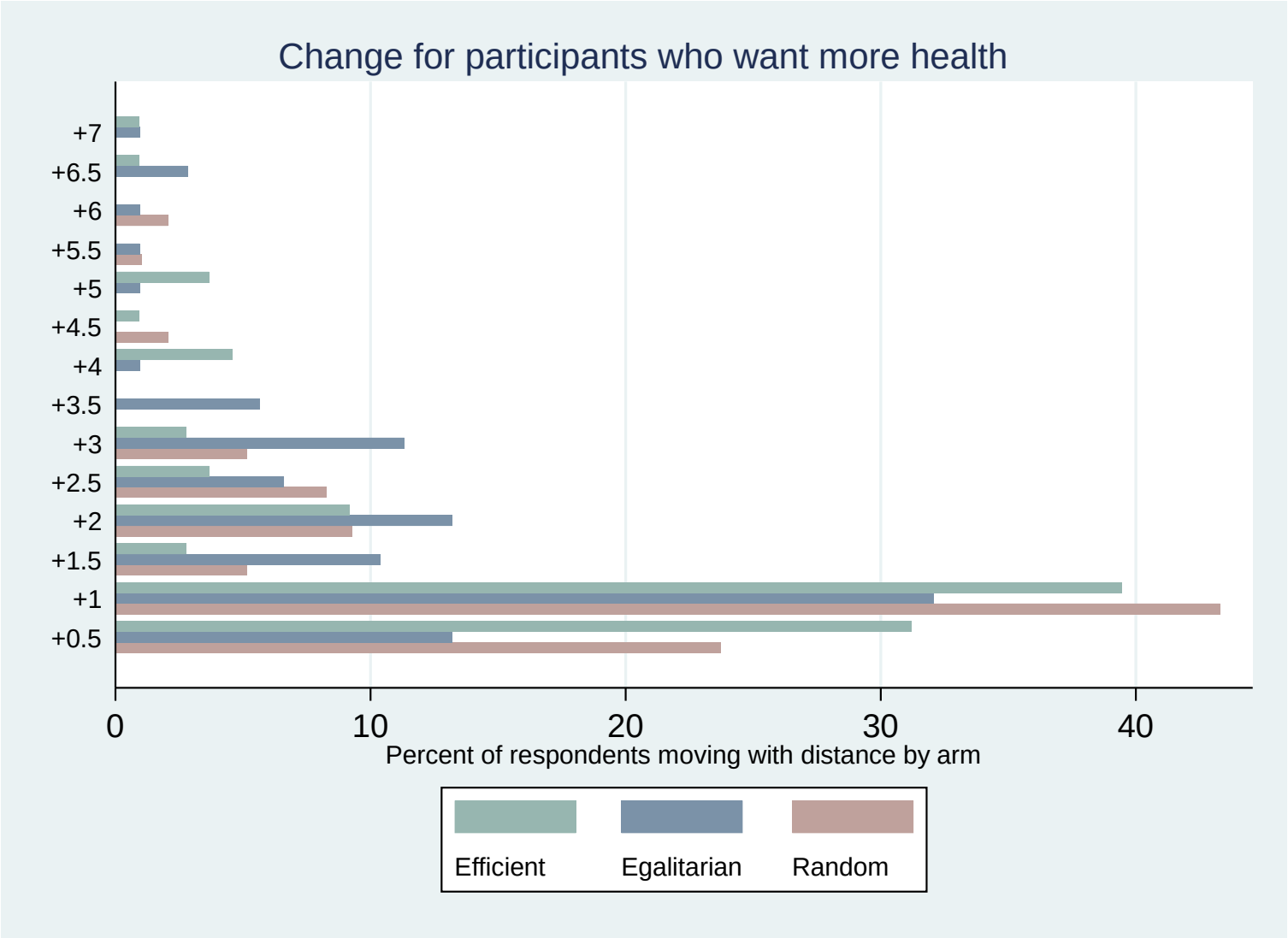

Figure 7.10: change for participants who want more health for all starting points

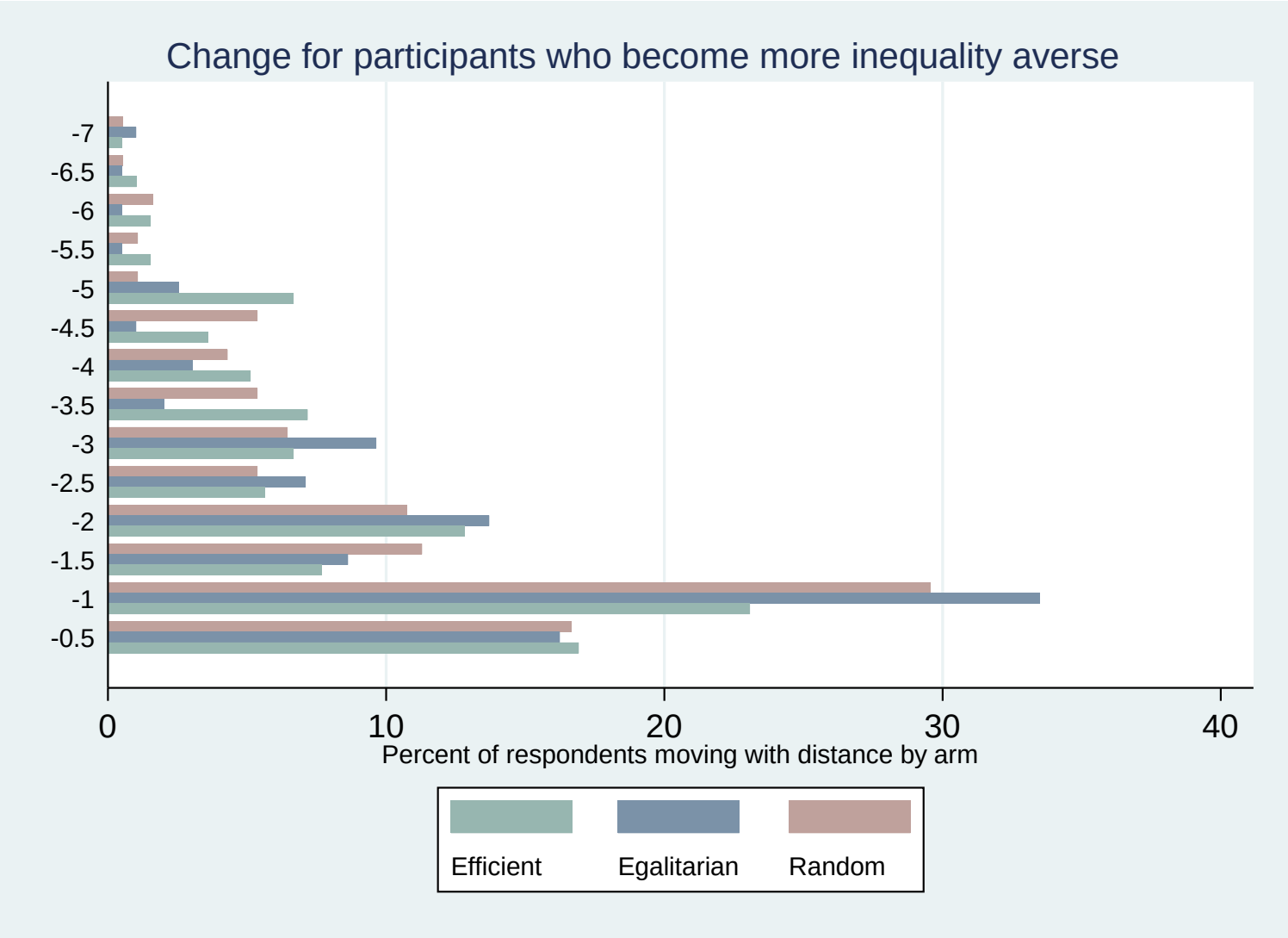

Figure 7.11: change for participants who become more egalitarian for all starting points

Across these two figures there is a similar pattern of clustering around a change of 0.5 and 1. However, It is important to consider the intuition and implication. An increase in the years of functioning dentition – i.e. a move toward more health – is indicative that participants are less willing to trade between efficiency and inequality, that there is less sacrifice of years of functioning dentition to reduce oral health inequalities. A move towards more egalitarian indicates participants are willing to sacrifice more years of functioning dentition to reduce inequalities. In the former however – where the willingness to sacrifice is less – the total years of functioning dentition is larger, and the oral health gain for the poorest is also larger. Participants who start with the egalitarian options may have learnt this in the previous exercise, and therefore may give an answer which appears less inequality averse by seeking more health for the poorest group.

7.4 Discussion

This chapter has considered evidence in relation to the hypothesis outlined in section 7.1: that inequality aversion is independent of the respondents starting point. Considering the results outlined in this chapter, which indicate that the distributional judgements are different, the inequality aversion parameters are different, and consequently the MRSS is also different for each starting point, there is little evidence to support this hypothesis. The evidence presented in this chapter indicates that the starting point does impact the indifference point in a benefit trade-off preference elicitation exercise.

Starting with a discussion of the distributional judgements and the starting points, the efficient and egalitarian starting points produce results which are weighted toward health maximisation and inequality reduction respectively. Those in the efficient starting point are also less likely to have the opportunity to trade (with over 50% of participants only seeing the first scenario in the neutral framing). This is only 32% in the egalitarian starting point and 30% for the random starting point. Given these figures, it is important to consider that the efficiency and egalitarian starting points, as presented at opposite ends of a scale lend themselves to slightly different questions. The efficient starting point asks participants the maximum they are willing to sacrifice to achieve inequality reduction, whilst the egalitarian starting point instead asks the minimum participants are willing to accept for those with the worst oral health. Whilst this can be compared to the contingent valuation literature, specifically Willingness

To Pay (WTP) and Willingness To Accept (WTA) it is interesting to observe that the inverse result is found – in WTP, those who are asked their maximum WTP tend to have lower values than those who are asked for their minimum WTA (Sayman and Öncüler, 2005; Van den Berg, Bleichrodt and Eeckhoudt, 2005). Here, those that are asked their willingness to sacrifice (comparable to WTP) have higher values than those who are asked their minimum WTA. Again, it is likely this is a product of the reference point in the starting scenario, as WTP and WTA rarely provide a non-randomised starting point to avoid introducing bias.

The importance of the reference point therefore cannot be overlooked. It is worthwhile reflecting that the median indifference point for the egalitarian first starting point is maximin/Rawlsian, i.e. the point where the gain for the worse-off group is equal across both Programmes, and may therefore be considered to be equitable. This is particularly noteworthy as participants do not know there are later scenarios which will continue to increase the oral health gain offered in Programme B. It is also important to consider that for all starting points, participants may not be comparing across Programmes (i.e. between A and B), and may instead be comparing between the values of Programme B when moving between scenarios. Considering this, there could be some bias introduced by what scenario is presented first with those with the more efficient starting points experiencing loss aversion. Those who start with non-monotonic options however do not experience this and may therefore be more likely to seek equity between the two Programmes. It is therefore possible that the starting point creates anchoring, impacting willingness to sacrifice or creating minimally acceptable thresholds.

The data associated with the egalitarian first starting point demonstrates the issue of non-monotonic preferences in inequality-efficiency trade-offs, meaning inequality aversion cannot be calculated for one of the three arms using the CES HRSWF specification. Although there are still useful outputs from the data regarding the distributional judgements, another specification relaxing the assumption of monotonicity must be applied to generate an inequality aversion parameter. Although Abásolo & Tsuchiya (2004) proposed a different functional form of HRSWF which can accommodate non-monotonic preferences this has not been used since it was proposed, and it does not account for potential non-health weights between the groups meaning it may be unsuitable in contexts such as this where inequalities are

often defined along socioeconomic status. Figure 7.9 provides additional evidence that there are differences in distributional judgements which are attributable to who receives the health gains, and that these are not an artefact of the starting point but a consideration of the groups themselves.

It is interesting to see the direction of change related to the non-health rationale, and how there is the potential for the impact on preferences to be multi-directional. Each starting point has respondents who want a larger health gain (i.e. toward health maximisers and pro-rich responses) and those which get more egalitarian when the scenario is framed socioeconomically. For the egalitarian starting point, the intuition may be complex – for someone who prioritises inequality reduction *more* when groups are socioeconomically defined may accept *less* of a health gain for the poorest groups. It is hard to distinguish these responses from those who accept less of a health gain for other reasons – e.g. to click through the exercise quickly, or because they believe poorer groups are less deserving of additional years functioning dentition. There is also the potential for a learning effect: as this is the second time participants have engaged in the BTO preference elicitation exercise, if they moved beyond the first scenario in the neutral framing they may (rightly) assume the pattern for the socioeconomic framing will be the same. They may therefore appear to become less egalitarian as they are seeking an option which provides a larger total health gain for the socioeconomically deprived.

Whilst it is difficult to accurately gauge engagement in any preference elicitation exercise, there is evidence provided here indicates engagement and consideration of the scenarios and Programmes posed. The fact that there is a change in response over the two framings indicate people have read and considered the information. Whilst the change over framings highlights the issue of anonymity in SWFs it does reflect how preferences change previous studies over framings and again implies people have read, understood, and considered the information (McNamara, Tsuchiya and Holmes, 2021). Given that each starting point has different distribution regarding the response to the first scenario is encouraging, and furthermore that the distribution of the efficiency first starting point and the egalitarian first starting point are not mirror images of each other (which would imply speed running) is encouraging that the responses provided are a reflection of preference.

This methodological study provides valuable insight into how the starting point of a BTO exercise may introduce bias. Whilst one study has examined this previously, they only tested one alternative ordering and finds no significant difference (Abásolo and Tsuchiya, 2013). This study considers two alternative starting points and finds significant impact of the starting point on the indifference point for respondents. It could be argued that the difference in findings is because the previous study focused on life expectancy, whilst this examines years of functioning dentition, but the evidence presented here also correlates closely to what is known in the behavioural economics literature regarding anchoring and endowment points. Whilst there may be differences in willingness to sacrifice – or accept – and therefore inequality aversion across life expectancy and years of functioning dentition, there is also likely to be a common impact of the frame of reference, as demonstrated here and in other economic disciplines.

The question remains however which is the more appropriate starting point to use in an inequality-efficiency trade-off. As with many stated preference exercises, a revealed preference will never be known. Using the data provided here it is important to acknowledge how the starting point has the potential to impact results, with an equity seeking behaviour in the efficient and egalitarian starting points representing different options (i.e. equitable may be the health maximising option for efficient starting point, whilst it is likely to be the Rawlsian option in egalitarian first due to anchoring). The random starting point is likely to give the best insight into what is a true preference, as it minimises but does not eradicate the potential bias introduced by the starting points. It is important to acknowledge that – what is currently being called a starting point bias – may be a reflection of preferences given the two extremes of policy, e.g. policies which seek to maximise oral health, and those which seek to reduce oral health inequalities. Often, policies seek to achieve one or another, it is unusual to get a policy with the explicit objective of reducing oral health inequality which will also provide oral health gains to the general population (although this is often an unintended consequence). It is therefore important to not dismiss these, but to acknowledge them, and to seek to understand if they are a true representation of preference. Having the additional starting points in the random arm lends itself to this perspective as it minimises the potential bias of starting at one of the ‘extreme’ ends of the scale, but still allows the response of a health maximiser or egalitarian.

7.5 Chapter summary

This chapter builds on Chapter 6, exploring potential sources of bias in the BTO associated with the starting point of the preference elicitation exercise. Using three different starting points – efficient, egalitarian and random – this study identifies that the first scenario seen influences the participants indifference point and consequently the inequality aversion parameter, marginal rate of social substitution and distributional judgements.

Chapter 8: Discussion and Conclusion

8.1 Introduction

This thesis set out with two aims: to explore the factors impacting workforce decisions, and to identify the priorities of the NHS dental service from the patient and public perspective. Across four data-driven chapters, this thesis has addressed these aims and in turn has made significant contributions to our understanding of NHS dental services. Chapter 4 provides an in-depth qualitative assessment of the factors which impact dental workforce decisions and offers a deepened understanding of why these issues are especially relevant in the current climate. Chapter 5 is one of the first pieces of work to consider what the NHS dental offer should constitute from the patient and public perspective, considering the constraints on funding for oral health services. Chapters 6 and 7 build on this work, applying a Benefit Trade-Off (BTO) exercise to oral health for the first time and therefore providing the first insight into if – and how much – members of the public will prioritise inequality reduction when it comes at the cost of oral health gains for other members of society. Chapter 7 also provides a valuable methodological contribution regarding potential bias introduced into the BTO by the starting point for respondents, which is relevant for all future studies wishing to conduct a BTO – including across different healthcare services and countries.

The following sections will firstly summarise the findings from the data presented in Chapters 4-7 before discussing the findings in relation to the aims, and implications for policy and research. The final sections will explore the relative strengths and weaknesses of this body of work and provide final concluding remarks.

8.2 Chapter summaries

8.2.1 Chapter 4 Summary – Public or Private oral healthcare provision

Chapter 4 presents a qualitative exploration of the factors which influence dental professionals' decisions about which sector to work in, and how much labour to provide. Using a framework approach, the data is analysed using the central themes of push and pull factors. There are numerous sub-themes, including ideological considerations, the dental contract, and skill development. The theme catalysts explores why the issues outlined by the push and pull factors – which are arguably historic – have lead NHS dentistry to crisis point in the past four years. The sub-themes identified include exogenous factors such as COVID, the cost of living and

endogenous considerations such as diminishing hope as amplifying the push from NHS dentistry and the pull toward private care.

8.2.2 Chapter 5 Summary – Oral Health and the Oral Healthcare System: the population perspective

Chapter 5 collects data from members of the public exploring the role of the NHS dental service, and how that should co-exist with a private dental sector and explores who should be involved in the decision making process. These considerations are integral to the dental contract reform process to ensure an oral healthcare system which is reflective of the values held within society.

The themes identified include oral health and the NHS, priorities for NHS dentistry, acceptable differences and the decision making ecosystem. In oral health and the NHS different perspective regarding NHS provision in terms of what oral health means in the context of the NHS, who should be eligible for NHS dental services and how the service should be paid for are discussed. Whilst there was a variety of opinions documented, a strong consideration was vertical equity – that people experiencing financial hardship should always be able to access NHS dental treatment. There were concerns raised in the theme ‘acceptable differences’ about what the division between private and public oral healthcare truly meant in terms of quality of care, and also the wider implications of the visible difference that may arise between those who can, and cannot, afford cosmetic oral healthcare and the associated psychosocial, quality of life implications. Participants identified that alongside oral health, inequality reduction, access, prevention and ensuring a stable workforce should be a priority for NHS dentistry and they highlighted the role of PPIE, with some strongly advocating for the involvement but others wary about how much valuable input average members of the public would be able to contribute to decision-making in dentistry.

8.2.3 Chapter 6 Summary – Eliciting public preferences for efficiency-inequality trade-offs in oral health

Chapter 6 took a quantitative approach to evaluating the relative priorities of oral health gains and inequality reduction, using years of functioning dentition as the measure of oral health. Whilst Chapter 5 identified priorities, it did not explore the relative importance of these or the trade-off which often has to be made between offering health improvements at a national level, and inequality reduction (Williams,

2005). Given the oral healthcare system is constrained, and at a critical juncture where decisions need to be made about the purpose of the oral healthcare system, quantifying if participants are willing to sacrifice efficiency in order to reduce oral health inequalities provides valuable insight into the direction of reform for NHS dentistry.

As this thesis is the first study to use the BTO methodology in oral health, Chapter 6 presented considerations and application to oral health. The analytical outputs considered included distributional judgements, an inequality aversion parameter and a Marginal Rate of Social Substitution (MRSS). Over 50% of responses were pro-rich or health maximisers, and the inequality aversion parameter was 1.02, but the single largest distributional judgement category was weighted prioritarian. This indicates that whilst the majority of respondents are not willing to trade a gain in functioning dentition to achieve an inequality reduction, a not insignificant proportion believe that both inequality reduction and efficiency should be taken into account. For the socioeconomic framing, the median response was weighted prioritarian and the inequality aversion parameter was 2.21. This shows that when framed socioeconomically, over half of the respondents are willing to trade-off at least half a year of functioning dentition to reduce oral health inequalities. The MRSS calculated for the trade-off was 1.58, meaning that an additional year functioning dentition to the poorest in society is valued at 1.58 times higher than an additional year of functioning dentition to the richest in society.

8.2.4 Chapter 7 Summary – Starting points and inequality aversion

Chapter 7 conducted a methodological study to assess if the starting point of the BTO impacts inequality aversion. The alternative starting points were the most egalitarian scenario (which was the least efficient, with subsequent scenarios increasing in efficiency) a random starting point (where the subsequent pathway was determined by the participants response). The starting points are referred to as: efficient, egalitarian, and random. The same analytical outputs were produced, meaning the distributional judgements, inequality aversion parameter and MRSS were all presented for these alternative starting points.

The findings for the distributional judgements showed that the median response changed according to the starting point, with efficient starting point having a median respondent in the health maximiser category, the egalitarian having a maximin

median respondent, and the random having a weighted prioritarian median respondent. The largest single distributional categories however were the same for the efficiency first starting point and the random: weighted prioritarian. The largest single category for the egalitarian starting point was egalitarian. Consequently, an inequality aversion parameter could not be derived for the egalitarian starting point. The inequality aversion parameter 1.02 for the efficient first starting point and 5.38 for the random.

In the socioeconomic framing, the median respondents fell into the largest single category, with the median response and largest single category being weighted prioritarian for the efficient and random starting points, but egalitarian for the egalitarian first starting points.

The MRSS was not available for the egalitarian starting point, but for the random starting point the value was 7.95, meaning an additional year of functioning dentition to the poorest group is worth 7.95 years of functioning dentition to the richest group. This is compared to a value of 1.58 found in the previous chapter for the efficient starting point. This implies a sacrifice of 1.58 or 7.95 years of functioning dentition for the richest group to increase the years of functioning dentition to the poorest group by 1.

These results clearly indicate that the starting point impacts inequality aversion, with the egalitarian starting point finding results which indicate that inequality aversion is infinite. The difference in distributional judgements and inequality aversion parameters between the neutral framing and the socioeconomic framings indicate that who receives the additional year(s) functioning dentition matters. However, the analysis also shows that the change in responses over framings is consistent, i.e. the effect is a product of the framing, not the starting point.

8.3 Thesis findings and their implications

This thesis has identified a range of considerations for the future of NHS dentistry. In relation to the first aim regarding workforce decisions, the evidence presented shows that although there is often a strong ideological pull towards providing labour in the NHS, working conditions are a critical issue when deciding how much to work in the NHS and the 2006 contract arrangements have perpetuated, not addressed, workforce issues of feeling undervalued, time-pressured and stressed (Collin *et al.*,

2019). The findings also suggest that this has evolved into a critical issue because exogenous factors mean demand shifted, whereas previously the workforce remained providing NHS dental care as they believed there was insufficient demand to provide more private care sustainably (Lynch and Calnan, 2003). The restrictions regarding the supply of dental care due to COVID created a vacuum in which dental services were not available, and consequently their value increased, and supply has shifted to meet this, creating a self-perpetuating cycle where now there is limited supply of labour in the NHS, meaning more people have to seek private care, and therefore strengthening the private dental care market.

The second aim was to identify the priorities of the NHS dental service from the public and patient perspective. The qualitative study demonstrated the complexity of creating a national oral healthcare system which is universally accepted as it presented a diverse array of opinions regarding what standard of oral health the NHS should provide, and how it should be paid for. There was largely consensus that those who could not otherwise afford care should always be entitled to free NHS treatments – i.e. the 'who' should receive dental care appears to be clearer then the 'what' they should receive. This is largely reflective of other literature – as financial hardship is often identified as something which should not prevent people from accessing oral healthcare, but there is debate regarding what services this should cover (World Health Organization, 2021). Other priorities included inequality reduction, access, and ensuring a sustainable workforce. Given the issues currently facing members of the public attaining access to primary dental care, it is somewhat unsurprising to find these concerns reflected in the literature, at a parliamentary, public and academic level (Health Social Care Committee, 2023; Healthwatch, 2024; Public Health England, 2021; Watt *et al.*, 2024; Williams, Fisher and Edwards, 2023). What is however more salient is that these priorities reflect what was outlined in the Steele Report from 2009, highlighting the lack of progress which has happened in NHS oral healthcare in the last 15 years (Steele, 2009). Given the findings from the dental profession in Chapter 4, it is clear that to operationalise priorities within NHS, there needs to be a sufficient workforce. The implication is therefore system reform is of imperative importance, in particular addressing the dental contract to mobilise the workforce and enabling issues of oral health, access and inequalities to be addressed.

A natural consideration regarding the priorities of objectives in a nationally-funded oral healthcare system, and therefore resource allocation – particularly given the wider context of system reform – is the relative importance of each of these given a system which operates under constraints. The objective of improving population health can often be in conflict with inequality reduction (Williams, 2005). This is true in dentistry too, as relatively easy policy wins – such as improving access to dental services for all – are likely to improve oral health but depend on utilisation which is more likely to come from those with better oral health. As participants in Chapter 5 noted: those with the worst oral health can also be challenging and resource intensive to reach, meaning they may not utilise the service to the same extent. Those with good oral health therefore will receive an improvement, and whilst those with the worst oral health will remain stagnant and therefore widen the gap. The issue becomes if, and to what extent should inequality reduction be prioritised given the opportunity cost to general population oral health. The data from the quantitative exercise in Chapter 6 suggests there should be a balance between these efficiency considerations and the reduction of oral health inequalities, i.e. that inequality reduction should be prioritised but not to the extent of sacrificing oral health for the wider population. This finding sits at a contrast with the wider health literature, where other studies find stronger inequality aversion for life expectancy, however the figure is more comparable to studies which have considered inequality reduction in quality of life (Abásolo and Tsuchiya, 2013; McNamara, Tsuchiya and Holmes, 2021; Robson *et al.*, 2017).

8.3.1 Policy recommendations

Based on the evidence presented in this thesis, there are several policy recommendations. Firstly, the push and pull factors need to be rebalanced so the push no longer outweighs the pull. The sample interviewed showed a strong ideological commitment to the NHS but outlined that the working conditions were unsustainable. A key recommendation from this thesis is therefore to reform NHS dental care to re-centre the focus on the patient to enable quality dental care in an NHS setting. This will allow practitioners to feel like they are able to fulfil their ideological commitment to dental care in an NHS setting. In order to do this, there needs to be a shift away from the UDA targets which encourage target-driven care and creates time and financial pressure. With these changes it is possible the ideological pull and improved working conditions will increase the amount of labour

dental practitioners are willing to provide in an NHS setting. By drawing labour back into the NHS, it is likely this will improve the availability of NHS dental services, and therefore increase access.

This does however have equity implications: as stated previously, population-level initiatives such as increasing labour to NHS dentistry and increasing access are not likely to reduce oral health inequalities, and instead may have the adverse effect of increasing them. Despite the qualitative study identifying inequality reduction should be prioritised, the quantitative trade-off study indicates that oral health considerations at the population level are of paramount importance and therefore would endorse strategies which seek to increase population level oral health. The next section will evaluate the dentistry recovery plan in light of these findings.

The recovery plan

The recovery plan addresses some key issues raised in this thesis. Increasing the UDA payment will help with some of the issues created by the cost-of-living crisis, but it is unclear if the new minimum amount of £28 will be enough to offset the increases cost of utilities, materials and lab work (Department of Health and Social Care and NHS England, 2024). Similarly, additional payments for new patients may alleviate some fear regarding accepting new patients, but participants also spoke about being overstretched with their current patient base who presented with multiple issues post-COVID. It is therefore unlikely that the payment for new patients will create capacity in a system which is already over-stretched, and a new patient payment of £15 or £50 has the UDA equivalent value of 0.54 or 1.79 (assuming the new minimum UDA value of £28). Assuming the new minimum payment of £28 per UDA, the reimbursement for a current and a potential reimbursement for a new patient is as displayed in Table 8.1:

	Current patient		**New patient**	
Band	UDA rate	Reimbursement	UDA equivalent	Reimbursement range
1	1	£28	1.54 or 2.79	£43 or £78
2	3	£84	3.54 or 4.79	£99 or £134
	5	£140	5.54 or 6.79	£155 or £190
	7	£196	7.54 or 8.79	£211 or £246

3	12	£336	12.54 or 13.79	£351 or £386

Table 8.1: Reimbursement for current and new patients under the Recovery Plan

Again, it is unclear from these figures if the 'new patient premium' is enough to offset the uncertainty and risk dental practices feel when accepting new patients, and to offset their potential treatment costs so the practice does not incur a net loss. One thing remains clear: the UDA based contract remains firmly at a disadvantage relative to private practice, where dental professionals are paid per item for the care they deliver and they do not have to feel that by seeing a patient they may incur a financial loss which is the uncertainty when seeing a patient under NHS UDA reimbursement.

The aims of the recovery plan also clearly set an intention to improve access to NHS dentistry for all. There is no mention of inequalities, or inequality reduction, whilst the evidence presented from Chapter 5 and Chapter 7 indicates that there is some public support for inequality reduction. On balance, it is unlikely the plans outlined in the recovery plan are going to positively impact existing oral health inequalities. Whilst there is some potential that the 'Smile for Life' initiative and water fluoridation – if properly implemented, funded and supported –will reduce oral health inequalities for future generations, by increasing access for *all,* increased utilisation will only happen for *some,* and it is unlikely that these will be the worst-off in society (Healthwatch, 2024). As outlined in the previous paragraph, it is unlikely that the additional premiums will be enough to offset the risk of taking new patients, particularly in deprived areas where oral health tends to be the worst (Public Health England, 2021). Whilst the objective of access, and prioritising efficiency over inequality reduction aligns with findings from Chapter 6, the fact that the inequalities are along socioeconomic divides means that they should be given additional weight and there should be some balance between inequality reduction and oral health gains at the population level.

8.3.2 Implications for future research

Whilst this thesis presents results regarding the trade-off between efficiency and inequality in oral health from the public perspective, there are other priorities outlined where the relative importance has not been explored. Similarly, for dental professionals future research should consider the relative strength of the push and pull factors.

The results from the quantitative trade-off are to be interpreted with a certain amount of caution. Due to the underlying assumptions of social welfare functions, and what is now known about the assumption of anonymity, it is necessary to engage with a two-step derivation process where only the impact of anonymity, or the inequality aversion, can be directly observed. The other is implied, and the derivation process is relatively new and to date has only been used infrequently.

The other issue outlined in this thesis is the potential impact of the starting point on results from the BTO. Whilst one other study has examined how randomising all scenarios impacts results, this is the first study which systematically alters the starting point and offers the following scenarios in an incremental ordering (Abásolo and Tsuchiya, 2013). The alternative staring points presented in Chapter 7 suggest that the results are vulnerable to bias according to which is shown to respondents first. Whilst this study has begun to build understanding in this, there is further value in investigating. One potential mechanism to assess the validity of the random starting point approach – with systematically ordered follow-up scenarios – would be to compare this to an ordering which has randomised the starting point and subsequent scenarios, as is common in willingness-to-pay (WTP) literature (Smith, 2006). This approach was not used in this study for two reasons: firstly, to minimise the burden on participants. Secondly because previous studies which have used this approach lost a large proportion of their sample due to 'irrational' response patterns such as participants switching between programmes and indifference multiple times (Robson *et al.*, 2017). However, conducting a study which randomises the starting point and subsequent scenarios, and a random starting point with systematically ordering follow-up questions (as used here) could lend validity to the random starting point.

8.4 The continually evolving landscape

The timeliness of this research cannot be understated, which is both a strength and a weakness. As NHS dentistry is currently changing, the findings from these studies provide useful information about the priorities for the national oral healthcare system going forward, both in terms of the purpose of NHS dentistry and for ensuring there is a workforce available to provide NHS dental care. However, the changing landscape of NHS dentistry also provides a challenge and a potential limitation. As noted in Chapter 4, during the qualitative data collection there were changes announced to

the dental contract, which were to be implemented later in 2022. This means that commentary around the ‘current’ contract refers to the contract before these changes were implemented, and only the opportunity for speculation about what this meant for the profession was available. Although the changes announced were considered minor, there has also been further changes announced in early 2024 as part of the NHS dentistry recovery plan which were implemented on the 1st of March 2024 (Department of Health and Social Care and NHS England, 2024). Due to when these changes were announced it was not possible to collect further data regarding what, if any, difference these proposed changes mean for the profession and how this impacted the push and pull documented in Chapter 4. Whilst reflection has been offered in section 8.3.1 – it is only from the informed perspective of the author.

The rapidly changing landscape is also an issue relevant for Chapter 5. Although the public and patient’s opinion is less relevant for the analysis regarding how the profession choose where to provide their labour, the changes to the planned reform (which were dropped during data collection in 2021) did impact the qualitative data collection and ultimately the research question. Furthermore, the cost of living crisis which is identified as a sub-theme in the dental professionals framework is simply not available for the members of the public framework: the data collection for this sample precedes the sharp rise in inflation which occurred in October 2021 (Harari *et al.*, 2024). As post-pandemic dental care has resumed and access to NHS dental services has continued to be restricted, coupled with the increasing cost of living it is not unlikely that these circumstances would impact the interviews if they were held today and potentially would have been developed as a cross-cutting theme (Watt *et al.*, 2024).

Similarly, it is likely that although cost of living was not a consideration of the qualitative data collection for members of the public, it will have been an issue prevalent and relevant for the data collected in Chapters 6 and 7 about quantifying the efficiency-inequality trade-off. There may therefore be an unobserved shift in public opinion between the data points, with people less willing to trade efficiency for inequality reduction in NHS oral health services as private care becomes increasingly unaffordable, and they become increasingly worried about their own ability to access NHS dental services.

Another development which happened during the course of this thesis is the investigation into oral health services by the health select committee. What is notable is a priority they identified – and recommended – which has since been rejected – is the registration of patients to dentists (Health Social Care Committee, 2023). Whilst the data from the public highlighted the importance of being able to access NHS dental care, there was no mention of registration. This could be the result of participants not knowing the current system does not depend on registration, it could also be that registration is a secondary consideration, i.e. not a priority relative to other issues. This does however highlight the importance of public and patient input into the decision-making and priority setting process, that time needs to be spent with the public to understand what is important and why to have a dental care system which reflects the desires of the population who use, and depend, on NHS dental services.

8.5 Strengths and Limitations

The following sections outline some key strengths and limitations in this thesis.

8.5.1 Strengths

This thesis has used a combination of qualitative and quantitative methods to investigate some core social and economic issues in relation to NHS dentistry. For the qualitative chapters, the sample has been diverse and the data itself is rich, as is reflected in the breadth of thoughts and opinions evidenced. Similarly, for the quantitative chapters the sample is large, and broadly representative of those in England. This means that the results presented here should accurately reflect the diversity of thoughts, opinions, and trade-offs for the general population.

The data presented also investigates issues which, to the best knowledge of the author, have received little attention from the academic research sphere. Whilst inequality-efficiency trade-offs have been conducted multiple times in health economics, this is the first study to apply the methodology to oral health. This builds the foundation for similar quantitative methods to be used in the field of oral health. Furthermore, the issue regarding (potential) starting point bias has not yet been evaluated using a random starting point with systematic follow-ups, or by inverting the ordering to least efficient to most. This work therefore provides valuable insight into the methodology for all fields wishing to use a BTO.

Furthermore, little research has been conducted in the academic sphere regarding priorities for those funding, and using, NHS dental services at a broad, policy level. This is particularly critical at this point of time when NHS dentistry is undergoing reform, the cost-of-living crisis is continuing, the economy is in a recession, and there is an upcoming general election.

8.5.2 Limitations

There are limitations within this work. The sample for the qualitative studies are likely to suffer from (self) selection bias, meaning the people who wish to engage with interviews about NHS dentistry are likely to have issues, or thoughts, they specifically would like to discuss in relation to oral health or the NHS. Furthermore the recruitment mechanism for the members of the public qualitative interviews are likely to have produced a sample who are more engaged with issues prevalent in health-related research than the average member of the public. The trade-off exercise itself has a narrow focus compared to the priorities outlined in Chapter 5.

Whilst this study is pioneering in its application of the BTO in oral health it also means it does not have the benefit of learning from other researchers experience using the BTO in this area, and there are no results from oral health in which these findings can be compared with. It would be interesting to compare the results of this study, which uses functioning dentition as its measure of inequality, with another which focuses on oral health related quality of life. Other considerations, such as the interval of 1 year used in the trade-off, and the starting ages used in the scenarios were based on best judgement informed from the health economics literature. Since there is no alternative data to compare this to in oral health, it is not possible at this stage to understand if these adversely impacted results.

8.6 Concluding remarks

This thesis had two central aims: firstly, to identify the factors which impact where dental professionals choose to provide labour, and secondly to explore the views of the public in relation to the scope and priorities of the NHS dental service.

The first aim was addressed qualitatively with a sample of the dental profession. From this data a framework of push and pull factors was constructed which make NHS and private dental care less/more attractive to the profession. This chapter concluded that in order to create a stable workforce willing to work within NHS

dentistry, the balance needs to be addressed and changing working conditions stipulated by the dental contract will realign the ideological ideals of the profession with the service they are able to offer their NHS patients.

The second aim was addressed qualitatively and quantitatively with a sample of members of the public. Whilst there were several considerations of what constitutes oral health and therefore what services should fall under the remit of the NHS, financial hardship was considered an unacceptable barrier to accessing dental care. Priorities for NHS dental care included oral health, inequality reduction, access, prevention, and stabilising the workforce. To gain a deeper understanding, a quantitative exercise was issued to members of the general public in England assessing the trade-off between oral health gains and inequality reduction. The data presented showed that large proportion of the sample were willing to sacrifice some efficiency to reduce the inequality in years of functioning dentition when the scenario was framed socioeconomically. This was reduced when scenario was framed neutrally, and the majority of the sample preferred efficient options. Since inequalities fall along socioeconomic divides, future policies should balance efficiency considerations and inequality reduction. The methodological study highlighted the importance of the starting point in the preference elicitation exercise, indicating the potential for starting point bias.

Appendix

Appendix item A: Topic guide for dental professionals (final version)

Research question:

What is equitable oral health and what is the role of the dental practice?

What should a dental healthcare system look like? What should the differences between NHS and private dental care be?

How to retain an NHS dental workforce

	TOPIC GUIDE FOR DENTAL PRACTITIONERS
General topic	Specific areas
Welcome	General welcome, introduce self, ensure they have read and understood the PIS and signed consent form, recording
Introduction	So we're going to be talking about the dentistry in general and the NHS dental care system. It's important to discuss this from all perspectives – so across a range of roles and practices. This is an informal conversation. It's important for you to know that this is a no judgement environment, there is no right or wrong. I am interested in hearing what you think and understanding why. You should also be aware that I don't have a clinical background and I haven't worked in practice so I may require some clarity around some of the language you use. Zoom advs/disadvs So how this is structured we're going to be going through sections about the past, present and future of dental care.

Opening discussion (warm up)	We're going to begin by discussing your role delivering dental care in England. • Can you tell me about your current role? *Follow-up:* how did your career progress and what lead to your current role? *note*: Cover advantages/disadvantages of various roles, ask re ability to care for their patients • Have you worked in any other roles, or at any other practices? *Follow up:* Can you tell me a bit more about __? *note*: get them to compare/contrast, particularly if experience with FFS and 2006 contract • Can you tell me about your decision to provide private/NHS/CDS care? • How do you think dentistry has changed during your time delivering dental care? • Is the potential of litigation something you are aware of in your practice? How does this impact how you deliver dental care?
Private v NHS dental care	• Can you tell me your opinions of private/NHS dental care? • Do you think NHS dentistry and private dentistry provide patients with different services? *follow-up:* If so, how? *follow-up:* do you believe there to be a difference in the customer service/clinical care/quality of care offered? Do you think there are differences in terms of what private or NHS providers are able to offer their patients?

Dental contract specific questions	That's great thank you. I want to talk to you a little bit more generally about the dental healthcare system and the future of dentistry. However we move onto how we would like the dental healthcare system to function, I think it's important to talk about the current situation. • What are your thoughts on the current NHS dental contract? • There were 'tweaks' to the contract announced recently, what do you think about these? • What are the key issues a new dental contract should address? *Prompt*: use of workforce, banding system for treatments/variable UDA rates/payment system, registration for patients • There's been a lot of attention around the dental workforce. How do you think the NHS dental contract should be changed to make NHS dentistry viable for practitioners? • How do you think NHS dentistry should be changed to retain dental graduates and bring private providers back to NHS dentistry? • *Private provider:* Would the changes you've described be enough for you to begin offering NHS services? If no find out why

Equity and equality	• Currently NHS dentistry is limited to treatments which only address the functionality of teeth and health of the mouth. This may mean that conventionally aesthetically pleasing teeth are unaffordable to those with low incomes who rely on NHS dental care. What do you think about this? • Are there any (other) instances in dental care that you can think of where being able to pay more should be able to get you a better quality service? For example, only being able to access implants under specific conditions in NHS dentistry but being able to buy them freely in private practice *prompts: accessibility of services (for example seen quicker), availability of treatments (cosmetic), higher quality dental care (better equipment, more freedom with treatment options)* • Do you think this is fair for people who cannot afford private care? • As the evidence base for dentistry is still growing, some NHS services are available but we are unsure about their clinical benefit. Do you think it is ethical to charge patients for treatments which they want but provide no clinical benefit, or not? *Follow up:* Is this different for NHS and private dental care? We've been talking a little bit about ethics and fairness. Often, a policy objective is to reduce inequalities in health. However it is not clear what this means in terms of oral health. • To you, what does equitable oral health mean?

Forward thinking/aims for dentistry	Great thank you. In the next section I'd like for us to think more about what we think NHS dental care can and should do in the future. • Can you tell me what you think the future of NHS dentistry looks like? • Is this different to what you think NHS dentistry should be aiming for? How? • What do you think the aims of NHS dentistry should be? • **How can a reformed dental contract help dental professionals reach these goals?** • What do you think the role of private dental care should be? • Something we have(n't) mentioned is access, specifically in relation to the cost of dental care. Do you think there should be changes to the NHS dental charges and who should be eligible for free care? That's great thank you. • Obviously dental professionals are a very important factor to achieving ___. What do you think the role of the national government and local authorities should be in achieving these goals?

Priority setting	Fantastic thanks. We've talked about a lot of stuff there and it's quite an ambitious agenda. Unfortunately it's likely that in the future the NHS will still have limited funding – and even if the dentistry is awarded a lot more money, the capacity of the workforce is also limited. Ultimately this means that we still need to make decisions about what should be the priorities for NHS dental care. • What do you think should be considered when prioritising NHS dental care? *If needed*: so, for example, NHS England currently offers dental care which will improve the function and health of the mouth of teeth but some may argue what is important is the quality of life to the patient *Follow-up:* prevention of dental health problems and the reduction of health inequalities are also talked about a lot in relation to NHS dentistry. Do you think these factors should be considered when making decisions about NHS dental services? *If no:* make sure to explore why *If yes:* ask about the relative importance of things • Do you think reducing oral health inequalities should be prioritised? • Who do you think should be consulted when making these decisions? • You've mentioned ___. Do you believe there to be a role for (government, NHS England, dental professionals, patients, taxpayers)? • Should all of these groups have equal representation? *Follow-up:* Tell me a little bit about why you think that
COVID section	Obviously, the pandemic has had a huge impact on dentistry in England. • How has the pandemic changed your opinions regarding dental care systems?

Closing	We've come to the end of the questions that I wanted to ask you. • Before we finish, is there anything else you would like to add? That's great. This has been a very interesting discussion and will really help to shape my research, thank you for taking part and giving up your time to talk to me. In order to claim your fee for participating, there's a form to complete. I'll email this to you shortly with some instructions

Appendix item B: Participant information sheet for dental professionals

Participant Information Sheet – interviews for dental professionals

Dental Care Preference Elicitation: An Application to NHS Dental Contract Reform

Newcastle University ethical approval reference: **9206/2020**
***IRAS project ID*: 279839**
Participant ID: **001**

Invitation and Brief Summary
You are being invited to take part in a research study. Before you decide whether or not you wish to take part it is important that you understand why the research is being done and what it will involve. Please read this information carefully and discuss it with others if you wish. Take time to decide whether or not you wish to take part. If you do decide to take part, you will be asked to sign a consent form. However, you are free to withdraw at any time, without giving any reason and without any penalty or loss of benefits.

What is the purpose of the research?
This project looks at what is important to dental professionals about providing dentistry, what they think NHS dental care should provide and how to improve the dental contract for dental professionals.

What does taking part involve?
If you decide to take part in the research you will be asked to give your availability for an interview with the lead researcher, Katherine Carr. The interview will cover topics such as your experience of providing dental care and dental care you think the NHS should be responsible for delivering. The discussion is expected to last between one and two hours. You do not have to prepare for the interview, however if you wish to see a more detailed list of topics, please contact the study team who can provide this to you.

Due to the ongoing COVID-19 pandemic the interviews will be held remotely, using the online platform Zoom or a telephone interview. These will be audio recorded for transcription using Zoom integrated software and an audio recorder. It will then be transcribed and any identifying information will be removed, meaning your data will be anonymous. The data will then be analysed by the research team.

What do I need to do if I would like to take part?
If you decide you would like to take part please visit complete the doodle poll in the email, making sure to select all sessions where you are available. It is also linked below:
https://doodle.com/meeting/participate/id/e0qPLPNd

You will be contacted by the lead research to confirm the time and date of your interview.

What information will be collected and who will have access to the information collected?
We will use your name and contact details to contact you organise a time for the interview. Only the lead researcher will have access to this information. The demographic information

which has already been collected has been used to ensure we interview a diverse group of people. You are not identifiable from this information, and summary information about the people who have been interviewed (for example, '4 people in the North East were interviewed') will be accessible to the study team and may be made available as part of a publication. Any information which makes you identifiable will only be available to the principal investigator for the purposes of organising an interview and will not be shared or published.

The interviews will be recorded and will remain confidential after the data has been collected. Your name will be removed and instead a code will be assigned. Your interview will then be transcribed by an external company who will operate under a confidentiality agreement and any additional potentially identifying information will be removed. The anonymised data will only be available to other researchers on request and will only be supplied if there is a reasonable justification. The data will be kept on Newcastle University's data repository for 10 years after the study completion. A full data management plan is available on request.

If you wish to be kept informed about the study and its progress, such as its publications, your contact details will be kept to facilitate updates. Otherwise your contact details will be removed after data collection has been completed. You will be able to access updates on the study via the study website (https://research.ncl.ac.uk/depend/) and twitter feed (@DEPENDproject).

Why have I been invited to take part?
This study is looking to talk to dental professionals about their thoughts on dentistry in England and how it should operate with the NHS. We are looking to speak to a diverse group about their thoughts and opinions to make sure the profession is represented so we can make recommendations which are truly reflective of the workforce.

What are the possible benefits of taking part?
Your input into this study will generate recommendations to the Deputy Chief Dental Officer about NHS dentistry to help inform the contract reform process. They will offer evidence to policy makers so decisions made about the dental healthcare system can be reflect workforce preferences.

What are the possible disadvantages and risks of taking part?
There are no risks associated with taking part in this research. You will be asked to sacrifice some time in order to take part.

What will happen to the results of the research study?
The results of the study will be published in scientific journals and may be presented to academic audiences within Newcastle University and at conferences. You will not be identified in any results. A summary of the results will be available to you after the study has concluded.

What happens if I change my mind?
You can change your mind about participating at any point. If you have scheduled an interview but no longer want to participate please inform the study team, who may be able to offer your time slot to another participant.

If you are no longer able to attend your arranged session for other reasons, such as work commitments or illness, please let the research team know and we will try to find an alternative time.

Who is the sponsor and data controller for this research?
Newcastle University is the sponsor for this study based in the United Kingdom. Newcastle University will be using information from you in order to undertake this study and will act as the data controller for this study. This means that Newcastle University is responsible for looking after your information and using it properly.

The lawful basis for carrying out this study under GDPR is Task in the Public Interest, (Article 6,1e) as research is cited as part of the University's duties.

Your rights to access, change or move your information are limited, as Newcastle University need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, Newcastle University will keep the information about you that has already been obtained. To safeguard your rights, the minimum personally-identifiable information will be used.

You can find out more about how Newcastle University uses your information at https://www.ncl.ac.uk/research/researchgovernance/ethics/gdpr/ and/or by contacting their Data Protection Officer (Maureen Wilkinson, rec-man@ncl.ac.uk).

Who is funding this research?
This research is funded through a Doctoral Research Fellowship awarded to the principal investigator (Katherine Carr) by the National Institute for Health Research (NIHR).

Has this study received ethical approval?
This study has undergone HRA review (IRAS project ID 279839)

Who should I contact in order to file a complaint?
Any complaint about the research and how it is conducted will be addressed. If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions (lead researcher: Katherine Carr, 0191 208 8433, katherine.carr@ncl.ac.uk or their primary supervisor, Dr Chris Vernazza, 0191 2088396, christopher.vernazza@ncl.ac.uk).

If you remain unhappy and wish to complain formally you could contact the School of Dental Sciences, Newcastle University (0191 208 8347).

If you wish to raise a complaint on how your personal data is handled, you can contact the Data Protection Officer (Maureen Wilkinson) who will investigate the matter at: res.policy@ncl.ac.uk.

If you are not satisfied with their response you can complain to the Information Commissioner's Office (ICO): https://ico.org.uk/

Who should I contact for further information relating to the research?

If you would like further information regarding this study, please email the principal investigator:

Ms Katherine Carr (she/her)
katherine.carr@newcastle.ac.uk
School of Dental Sciences, Newcastle University, Framlington Place, Newcastle upon Tyne. NE2 4BW
Tel: 0191 208 8433

Please be aware that due to the coronavirus pandemic remote working is taking place across the University. It therefore may not be possible to contact the lead researcher via phone or post.

Appendix Item C: Consent form for dental professionals

School of Dental Sciences
Newcastle University
Framlington Place
Newcastle upon Tyne
NE2 4BW United Kingdom

Participant Identification Number for this study: **001**

CONSENT FORM

Title of Project: **DEPEND: DEntal care Preference Elicitation – an application to NHS Dental contract reform**
Newcastle University ethical approval reference: **9206/2020**
IRAS Project ID: **279839**

Name of Researcher: **Katherine Carr**

Please initial box

1. I confirm that I have read and understand the information sheet dated 06/07/2022 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 the interview will be recorded using a Dictaphone and using integrated Zoom software if being conducted online. I give permission for the interview to be audio recorded.	☐
3. I understand that the audio files will be transcribed by a third party operating under a confidentiality agreement. I give permission for the audio data to be shared with this third party.	☐
4. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.	☐
5. I understand that data collected during the study, may be looked at by individuals from Newcastle University or from NHS Research and Development Offices (the regulatory authorities), where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.	☐
6. I agree to take part in the above study.	☐

Name of Participant	Date	Signature
Katherine Carr Name of Person taking consent	Date	Signature

When completed, 1 for participant; 1 for researcher.

Participant Consent Version 5 07/07/2022

The University of Newcastle upon Tyne trading as Newcastle University

Appendix item D: topic guide for members of the public (final version)

	TOPIC GUIDE FOR MEMBERS OF THE PUBLIC V12
General topic	Specific areas
Welcome	General welcome, introduce self, ensure they have read and understood the PIS and signed consent form I would like to begin by thanking you for agreeing to take part in this interview. I'm Katherine Carr, a PhD student at Newcastle University undertaking research regarding the value of dental services, particularly with respect to NHS dentistry What we discuss today will be important for both understanding what people want from a dental service, particularly one which is partially funded through tax, and help design a questionnaire for another stage of the research. It's important to collect views and opinions of all members of society, whether you use NHS dental care or not. It's important for you to know that this is a no judgement environment; you are encouraged to express your views and opinions as there is no right or wrong answer. You may also be unsure about how to answer a question – it is fine to ask for clarification or say you don't know. You received a participant information sheet last week, do you have any questions relating to that or more generally before we begin?

	Great. As we are on Zoom, if you need a break for any reason, if there is someone at the door or you need to get a drink – just let me know and we can resume once you come back. If for any reason you get disconnected from the call, re-join the room when you can. I will do the same if I have problems with my internet connection.
Opening discussion	I'm going to start by asking you about your experiences with dentistry before talking a bit more generally about NHS dentistry. • Can you tell me a little bit about your experience with dental care? *Topics may cover*: in school dental care, dental appointments, community dental services, emergency care. *Steer:* interest in dental appointments (other topics are out of scope of the project). Particular interest in what they consider their 'usual' behaviours and what experiences formed this • What have been the good and bad parts of your experience? *Topics:* ability to access dentist, dental pain, types of treatment received • What do you like to happen in your dental appointments? *Is this something which you think happens in your dental appointments?* • Can you describe any way you think your dental care could be improved? *Steer:* better relationship with dentist, more frequent appts, better understanding of treatments • How much do you feel you know about your oral health and dental disease more generally? • Do you think knowing more about your oral health would change your behaviours? • Do you think you treat your oral health differently to other aspects of your health? • How would you described your use of NHS services more generally?
Dentist-patient relationship	• Over the last couple of years how often have you been to the dentist?

	• Do you also see other members of the dental team, such as a hygienist? • Is this a typical pattern for you? *Steer:* more frequent? Less frequent? *Likely to come up:* Impact of COVID. **Follow-up**: how have you felt about being able to access the dentist less? Would you like to resume frequent appointments? Why? **IF REGULAR** • When you do have a dental appointment, is there a specific dental practice you like to go to? OR you mentioned you've been using the same practice for a number of years. Can you tell me a little bit about why your picked that practice? *Topics:* location of dental practice, ease to get appointment, like their dentist *Potential follow-up:* you mentioned that getting an appointment is important to you. Is that something you have experienced difficulty with in the past? • Is there a particular dentist/hygienists (relate to above) you try to see? - If yes: can you tell me about why you choose to go to that dentist? *Topics: location of dental practice, ease to get appointment, like their dentist* *Steer: make sure to find out **why** – what is it they like about their dentist. Communication? Familiarity? Trust? Thorough treatment?* • How important do you think the quality of the dental treatment you receive is? *how does this compare to everything else you've described?* • How would you judge quality? • Do you consider yourself to be a customer of dental care?

	NOT REGULAR • Can you think of any reasons why you don't see a dentist regularly? *Topics:* expense, time, location, availability of appointments, don't perceive a 'need' (not in pain), anxiety • What would make you seek dental treatment? *Topics:* pain, concerns about teeth, pressure from peers, appearance • Is there anything you can think of that would make your attendance more regular? OR *(relate back to previous answer, e.g.):* You mentioned that there aren't any dental practices near you. If a dental practice opened closer to your home, would you then try to get an appointment? • So we need to use our imaginations a little here. Imagine that you want a dental appointment. can you tell me a little bit about what you think would be important to you when picking a dental practice? • *Follow-up:* is there anything else you think would be important? • For some people, it is important they receive care continually from the same dentist. Is this something you think it is important to build a relationship with a dentist? • Can you tell me a little bit about why you think that? • How important do you think the quality of the dental treatment you receive is? *how does this compare to everything else you've described?* • Do you think people who do use dental care should be considered customers?

Scope of NHS	Thank you for that. It's really interesting to hear about your experiences and thoughts about the care you've received. Now we're going to talk a bit more generally about what you think dentistry should look like and what care NHS dentists provide. IF A PRIVATE USER OR NON-USER: before we start, can you tell me a little about your perceptions of NHS dentistry? In England, you can receive dental care from an NHS dentist or a private dentist. *Brief explanation of NHS dentistry:* NHS dental practices receive money from the government which is raised through tax. This goes toward the cost of providing dental care to NHS dentistry patients, although most patients still pay a co-charge (sometimes called a co-payment). This is a fixed amount which depends on the type of treatment you get. So for example, if you have an appointment – which is band 1 – with no further treatment this will cost £23.80. • I'm going to start with a very broad question. What do you think the overall aims of NHS dentistry should be? *Follow-up/prompt:* Previously, NHS England has said the goals of NHS dentistry are to improve the oral health of the population and increase access to NHS dental services. What do you think about these? *Steer:* make sure to cover access • As the NHS is tax funded, there is a limited amount of money which can be spent. This often means priorities have to be set amongst objectives. How would you prioritise the objectives we've discussed? • Can you tell me a bit about why you think __ is the most important?

Equity, equality	Some groups of people get free NHS dental care. These are those claiming benefits due to low income, in full time education or are pregnant. • What are your thoughts that some people have to pay a co-charge whilst others receive their care for free? *Prompt*: Are there other groups you think should be exempt from paying? • Should there be special efforts to target people with the worst oral health? We talked earlier about how you often have to set priorities within the NHS as there is not enough money to fund everything. If we want to improve oral health for those who have the worst oral health, and therefore reduce the gap between those with the worst oral health and the best, we might have to forgo options which improve oral health for those with moderate or good oral health. • What are your thoughts about this?

	To provide care to those with the worst oral health these options may also require more money than if we wanted to offer a oral health improvement to people with good oral health. • What are your thoughts about this? We're going to talk a bit more specifically about the dental care offered by NHS dental practices now, • Could you summarise for me what dental care you think NHS dentists should provide? *Prompts: urgent, preventative, addressing pain, cosmetic, community services, QoL enhancing, restorative* *(provide list of NHS dental treatments).* This is a list of the treatments which are generally provided at NHS dental practices. You can see there are a lot of treatments which you may be familiar with like a scale and polish. • Are there things not included here which you think NHS dentists should provide? *Topics:* preventative advice/treatment, cosmetic treatments *Steer:* make sure to find out **why** • Is there anything included you don't think NHS dentists should provide? *Steer:* make sure to find out **why** OR: What treatments do you think it is important for NHS dental practices to provide? As NHS dentistry uses taxpayer funds, and the NHS has limited resources, treatments offered by NHS dentists are those thought of as 'clinically necessary'. • What do you think a 'clinically necessary' treatment should be defined as?

	OK thanks that's very interesting. The NHS defines clinically necessary treatments as treatments required to keep the mouth, teeth and gums healthy and free of pain. • What do you think about the NHS only providing 'clinically necessary' treatments? • Do you think NHS dentists should try to meet what their patients want as well as providing clinically necessary treatments? • As more research is undertaken there is emerging evidence indicating some treatments which are frequently provided are not considered clinically necessary. Two examples of this are routinely provided scale and polish and dental appointments occurring once every 6 months. If only clinically necessary treatments are provided, it may mean NHS dentistry users can no longer access routine scale and polish and there may be more than 6 months between appointments. How does this make you feel? • Alongside the clinical trial these studies asked patients about the value of these services and were asked to give monetary estimates of how much they would be willing to pay to receive a regular scale and polish and 6 months dental appointment. Despite not offering a clinical benefit in most cases, these services received high values. What do you think about this? • In situations such as this, where services offer little clinical benefit are highly valued by the patients, do you think the public and patient perspective should be taken into consideration? *Prompt: Why?*

Role of private care	IF NHS USER: Before I tell you too much about private dental care, can you tell me a little bit about your perceptions of private dental care? Private dentists do not have this limitation and therefore the range of treatments from a private dentist can be different to those available from an NHS dentist. *(provide treatment lists for private dentist).* This is a list of treatments from a private dentist. • Do you think the same services should be available from NHS and private dentists? - If yes: If you look at the two lists you can see private dentists offer treatments which focus on appearance such as teeth whitening. Currently, these treatments are not provided by NHS dentists as they are thought to only provide an improvement in appearance. How do you feel about the money use to fund NHS dentists – which is raised through tax – being used for cosmetic procedures? - If no: can you explain how you think NHS and private dentistry should be different? • There are also treatments like implants to replace missing teeth. These are available from private dentists, whilst NHS dentists will offer different treatments such as a denture or a bridge to improve function. It can be argued that an implant offers a better replacement, but it costs a lot more than a bridge or a denture and the additional benefit of the implant is marginal. How does this make you feel? • Ultimately, if the dental healthcare system continues to provide only 'clinically necessary treatments' whilst private practices can provide cosmetic and more expensive treatments, only people who can afford private treatment may be able to access treatments which make their teeth more conventionally attractive. What do you think about this? • Do you think the motives of NHS dentists and private dentists are different, or not?

	• As NHS dentists are partially funded by tax and their patients, whilst private dentists are paid directly by their patients, do you think NHS dentists should be concerned with meeting the expectations of the public as well as their patients?
Payment mechanisms	There are different ways dental practices can be paid. For example, dental practices can be paid according to the treatments they provide (this can be a contracted amount or uncontracted) or according to the patients they see. • Do you think how dental practices receive money affects what care patients are offered or not? • Do you think how dental practices are paid is important? Does it matter to you? • In relation to your own experiences, do you think the care you have received has been appropriate? *Prompts:* over-treatment and under-treatment

Role of NHS England/government	We've talked a lot about the roles of dental practices and the types of care they provide. • Is there anything at a national level you think should be focused on or improved? *education, prevention, inequalities*
Decision making	We've discussed a bit about the different people who pay into the NHS dental system and make decisions about what care is available – the NHS England, the taxpayer and the patient. • Who do you think should be involved when making decisions, such as the availability of care and how the system works, with respect to NHS dentistry? *Steer:* make sure to cover NHS, taxpayer, patient and dental professionals • Can you tell me a little bit about why you think these people should be involved? • You mentioned __, __ and __. Do you think all these opinions should have equal importance in the decision making process? • Seeing as NHS dental care is funded through tax and co-payments, whose preferences do you think should be reflected in dental care? • Do you think the general public who do not use NHS dental services should be considered? *Steer:* should they be focused on providing value for money? Delivering the best care to their patient?
Closing	We've come to the end of the questions that I wanted to ask you. • Before we finish, is there anything else you would like to add?

	That’s great. This has been a very interesting discussion and will really help to shape my research, thank you for taking part and giving up your time to talk to me. Someone from the University will be in contact to issue your gift voucher. Generally, we offer vouchers for Amazon and Love2Shop. Do you have a preference for your gift voucher? Before I go, I was wondering if you would like to be involved in the next stage of my research. I will be using the information I’ve been collecting in interviews to build a choice exercise and I would like to discuss this with a focus group. Is this something you might be interested in?

Appendix item E: list of NHS and private dental treatments provided to participants

NHS Dental Treatments

- Sedation (referral)
- applying sealants or fluoride preparations to the surfaces of your teeth
- a clinical examination, assessment and report
- an orthodontic assessment and report
- a scale and polish (if clinically necessary)
- taking a sample of cells or tissue from your mouth for examination
- x-ray
- an addition to your dentures – such as adding a clasp or a tooth
- a mouth guard to correct your "bite" (doesn't include a laboratory-made appliance)
- fillings
- treatment for severe gum disease such as root planing (cleaning bacteria from the roots of your teeth), deep scaling and a polish, or a gingivectomy (removal of gum tissue)
- oral surgery – such as removing a cyst, or soft tissue surgery to the mouth or lips
- removing teeth (extraction)
- root canal treatment
- sealant to fill small holes or grooves in your teeth
- splinting loose teeth – for example, after an accident (this does not include laboratory-made splints)
- bridges – a fixed replacement for a missing tooth or teeth
- crowns – a type of cap that completely covers your real tooth

- dentures
- inlays, pinlays and onlays – used to restore damaged teeth
- orthodontics and appliances such as braces
- other custom-made appliances, not including sports guards
- veneers and palatal veneers – new surfaces for the front or back of a tooth

Treatments such as veneers and braces are only available on the NHS if there's a clinical need for them (not for cosmetic reasons). Similarly, other cosmetic treatments, such as teeth whitening, are not available on the NHS.

Private Dental Treatments (additional to NHS services)

- Sedation for nervous patients
- Restorative Treatments
- Gold inlay or onlay
- Porcelain inlay or onlay
- White filling
- Porcelain bonded crown
- All ceramic crown
- Teeth Whitening
- Dental Veneer (per unit)
- Invisalign® Consultation
- Invisalign® lite
- Invisalign® full
- Dental implants
- Partial denture (acrylic)
- Partial chrome cobalt denture (metal)

Appendix item F: Participant information sheet for members of the public

Participant Information Sheet – interviews for members of the public

Dental Care Preference Elicitation: An Application to NHS Dental Contract Reform

Newcastle University ethical approval reference: **9206/2020**
Participant ID: **000**

Invitation and Brief Summary

You are being invited to take part in a research study. Before you decide whether or not you wish to take part it is important that you understand why the research is being done and what it will involve. Please read this information carefully and discuss it with others if you wish. Take time to decide whether or not you wish to take part. If you do decide to take part, you will be asked to sign a consent form. However, you are free to withdraw at any time, without giving any reason and without any penalty or loss of benefits.

What is the purpose of the research?

This project looks at what is important to people about dentistry and thinks about how the current NHS dental care system can be changed to make dental care better for the population and for the people providing dental care.

What does taking part involve?

If you decide to take part in the research you will be asked to give your availability for an interview with the lead researcher, Katherine Carr. The interview will cover topics such as your experience of dental care and what you expect from NHS dentistry, along with discussing some proposed changes to the way NHS dental care is delivered. The discussion is expected to last between one and two hours. You do not have to prepare for the interview, however if you wish to see a more detailed list of topics, please contact the study team who can provide this to you.

Due to the ongoing COVID-19 pandemic the interviews will be held remotely, using the online platform Zoom or a telephone interview. These will be audio recorded for transcription using Zoom integrated software and an audio recorder. It will then be transcribed and any identifying information will be removed, meaning your data will be anonymous. The data will then be analysed by the research team.

What do I need to do if I would like to take part?

If you decide you would like to take part please visit complete the doodle poll in the email, making sure to select all sessions where you are available. It is also linked below:
https://doodle.com/poll/svrat3nx7rvq7qcf?utm_source=poll&utm_medium=link

You will be contacted by the lead research to confirm the time and date of your interview.

What information will be collected and who will have access to the information collected?

We will use your name and contact details to contact you organise a time for the interview. Only the lead researcher will have access to this information. The demographic information

which has already been collected has been used to ensure we interview a diverse group of people. You are not identifiable from this information, and summary information about the people who have been interviewed (for example, 4 people in the North East were interviewed) will be accessible to the study team and may be made available as part of a publication. Any information which makes you identifiable will only be available to the principal investigator for the purposes of organising an interview and will not be shared or published.

The interviews will be recorded and will remain confidential after the data has been collected. Your name will be removed and instead a code will be assigned. Your interview will then be transcribed by an external company who will operate under a confidentiality agreement and any additional potentially identifying information will be removed. The anonymised data will only be available to other researchers on request and will only be supplied if there is a reasonable justification. The data will be kept on Newcastle University's data repository for 10 years after the study completion. A full data management plan is available on request.

If you wish to be kept informed about the study and its progress, such as its publications, your contact details will be kept to facilitate updates. Otherwise your contact details will be removed after data collection has been completed. You will be able to access updates on the study via the study website (https://research.ncl.ac.uk/depend/) and twitter feed (@DEPENDproject).

Why have I been invited to take part?
This study is looking to talk to members of the public about their thoughts on dentistry in England and how it should operate with the NHS. We are looking to speak to a diverse group about their thoughts and opinions to make sure the public voice is represented so we can make recommendations which are truly reflective of societal views.

What are the possible benefits of taking part?
Your input into this study will generate recommendations to the Deputy Chief Dental Officer about NHS dentistry. They will offer evidence to policy makers so decisions made about the dental healthcare system can be informed by public opinion.

What are the possible disadvantages and risks of taking part?
There are no risks associated with taking part in this research. You will be asked to sacrifice some time in order to take part.

What will happen to the results of the research study?
The results of the study will be published in scientific journals and may be presented to academic audiences within Newcastle University and at conferences. You will not be identified in any results. A summary of the results will be available to you after the study has concluded.

What happens if I change my mind?
You can change your mind about participating at any point. If you have scheduled an interview but no longer want to participate please inform the study team, who may be able to offer your time slot to another participant.

If you are no longer able to attend your arranged session for other reasons, such as work commitments or illness, please let the research team know and we will try to find an alternative time.

Who is the sponsor and data controller for this research?
Newcastle University is the sponsor for this study based in the United Kingdom. Newcastle University will be using information from you in order to undertake this study and will act as the data controller for this study. This means that Newcastle University is responsible for looking after your information and using it properly.

The lawful basis for carrying out this study under GDPR is Task in the Public Interest, (Article 6,1e) as research is cited as part of the University's duties.

Your rights to access, change or move your information are limited, as Newcastle University need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, Newcastle University will keep the information about you that has already been obtained. To safeguard your rights, the minimum personally-identifiable information will be used.

You can find out more about how Newcastle University uses your information at https://www.ncl.ac.uk/research/researchgovernance/ethics/gdpr/ and/or by contacting their Data Protection Officer (Maureen Wilkinson, rec-man@ncl.ac.uk).

Who is funding this research?
This research is funded through a Doctoral Research Fellowship awarded to the principal investigator (Katherine Carr) by the National Institute for Health Research (NIHR).

Has this study received ethical approval?
This study has received ethical approval from Newcastle University (ref: 9206/2020)

Who should I contact in order to file a complaint?
Any complaint about the research and how it is conducted will be addressed. If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions (lead researcher: Katherine Carr, 0191 208 8433, katherine.carr@ncl.ac.uk or their primary supervisor, Dr Chris Vernazza, 0191 2088396, christopher.vernazza@ncl.ac.uk).

If you remain unhappy and wish to complain formally you could contact the School of Dental Sciences, Newcastle University (0191 208 8347).

If you wish to raise a complaint on how your personal data is handled, you can contact the Data Protection Officer (Maureen Wilkinson) who will investigate the matter at: res.policy@ncl.ac.uk.

If you are not satisfied with their response you can complain to the Information Commissioner's Office (ICO): https://ico.org.uk/

Who should I contact for further information relating to the research?
If you would like further information regarding this study, please email the principal investigator:
Katherine Carr
katherine.carr@newcastle.ac.uk
School of Dental Sciences, Newcastle University, Framlington Place, Newcastle upon Tyne. NE2 4BW
Tel: 0191 208 8433

Please be aware that due to the coronavirus pandemic remote working is taking place across the University. It therefore may not be possible to contact the lead via phone or post.

Appendix item G: Consent form for members of the public

School of Dental Sciences
Newcastle University
Framlington Place
Newcastle upon Tyne
NE2 4BW United Kingdom

Participant Identification Number for this study: 000

CONSENT FORM

Title of Project: **DEPEND: DEntal care Preference Elicitation – an application to NHS Dental contract reform**
Newcastle University ethical approval reference: **9206/2020**

Name of Researcher: **Katherine Carr**

Please initial box

1. I confirm that I have read and understand the information sheet dated 04/05/2021 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. ☐

3. I understand that data collected during the study, may be looked at by individuals from Newcastle University or from NHS Research and Development Offices (the regulatory authorities), where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records. ☐

4. I agree to take part in the above study. ☐

Name of Participant	Date	Signature

Name of Person taking consent	Date	Signature

When completed, 1 for participant; 1 for researcher;

Appendix item H: derivation process for the Marginal Rate of Social Substitution

As specified by Dolan and Tsuchiya (2009):

Starting with eq.1, the CES HRSWF specification:

$$W = \left[\alpha U_J^{-r} + (1-\alpha)U_K^{-r}\right]^{-\frac{1}{r}} \text{ (eq. i)}$$

Where:

- Where W is the level of social welfare
- U_J and U_K are the total level of individual wellbeing (u) of groups J and K (given U is the sum of u),
- α is the weight given to one group relative to another
- r is the inequality aversion parameter

Assuming anonymity holds, the weighting to groups U_J and U_K are equal and therefore $\alpha = (\alpha - 1) = 0.5$.

Continuing the example outlined in section 6.2.2, where there are two Programmes, A and B, which provide different distributions of functioning dentition to the two groups (J and K) and the point of indifference – meaning where the distribution of Programme A and Programme B are thought of as equally good is known – we can derive the Marginal Rate of Social Substitution. Expressing the point of indifference as $U_J\,(A)$, $U_J\,(B)$, $U_K\,(A)$ and $U_K\,(B)$ meaning the wellbeing of Group J at points A and B, and the wellbeing of Group K at points A and B respectively, the corresponding gradient at the midpoint of A and B is as follows:

$$-\frac{\partial U_K}{\partial U_J}\Big|_{\frac{1}{2}(A+B)} = \frac{\alpha}{(1-\alpha)}\left[\frac{U_K}{U_J}\right]^{(1+r)} = \frac{\alpha}{(1-\alpha)}\left[\frac{((U_K(A)+U_K(B))/2}{((U_J(A)+U_J(B)/2}\right]^{(1+r)} \text{ (eq.ii)}$$

This gives the gradient between the two points (A and B), and therefore gives the Marginal Rate of Social Substitution provided α and r are known.

To solve for r, an approximation of the same point can be given by:

$$\frac{dU_K}{dU_J} \approx \frac{U_K(B) - U_K(A)}{U_J(B) - U_J(A)} \text{ (eq.iii)}$$

By taking the log, the equation can be solved giving a unique value of r:

$$r \approx \frac{log\left[\frac{\left(U_K(A) - U_K(B)\right)}{\left(U_J(B) - U_J(A)\right)}\right] - log\left[\frac{\alpha}{(1-\alpha)}\right]}{log\left[(U_K(A) + U_K(B))/(U_J(A) + U_J(B)\right]} - 1 \text{ (eq.iv)}$$

The value of r is therefore expressed as a function of α. As α is a reflection of the weightings between each group, and assuming anonymity holds, we can therefore solve using $\alpha = 0.5$.

Appendix item I: questions on health and oral health

Our next set of questions are about your health, oral health and use of dental services.

How is your health in general, would you say it is…?

1. Very good
2. Good
3. Fair
4. Bad
5. Very bad

Would you say your dental health (mouth, teeth and/or dentures) is…?

1. Very good
2. Good
3. Fair
4. Bad
5. Very bad

Do you still have some of your natural teeth, or have you lost them all?

1. Have some
2. Lost them all

Adults usually have up to 32 teeth, including the 4 wisdom teeth.

How many **natural** teeth do you have?

Please exclude implants to replace missing teeth or dentures. If you are unsure, please give your best estimate.

1. None
2. At least 1 but fewer than 10
3. Between 10 and 19
4. 20 or more natural teeth

Sometimes people have teeth removed for cosmetic reasons (to improve the appearance of their teeth or to allow braces to be fitted). Other times people need teeth removed for non-cosmetic reasons (such as decay or dental disease which is unresponsive to treatment).

Have you lost any of your natural adult teeth or had any removed for non-cosmetic reasons?

1. Yes
2. No

How many of your natural adult teeth have you lost or had removed for non-cosmetic reasons?

How often do you go to the dentist? Is it…?

1. At least once every six months

2. At least once every year
3. At least once every two years
4. Less frequently than every two years
5. Only when having trouble with your teeth and/or dentures
6. Never been to the dentist

Thinking about the last time you visited a dentist, which of these options best describes the type of care you think you received?

1. Private dental care
2. NHS dental care that you paid for
3. NHS dental care that was free
4. NHS dental care followed by additional private dental care
5. Clinic at the dental hospital
6. Some other type of care
7. Not sure

Appendix item J: Attitudinal statements

1) The NHS should prioritise the oral health of poorer people over wealthier people.
2) It shouldn't matter if you are poorer or wealthier, the NHS should value improvements to everyone's oral health equally.
3) When the NHS makes decisions about oral health, they should focus on the overall amount of benefit being provided, not who that benefit goes to.
4) The NHS should just focus on improving the average oral health of people in the country, they shouldn't consider whether or not different groups of people have different levels of oral health.
5) The NHS should try and reduce the functioning dentition gap between poorer and wealthier people, even if this means average years of functioning dentition in the overall population will be lower.
6) When the NHS makes decisions about oral health, they should focus on people with fewer years of functioning dentition.
7) I believe that income and oral health are related.
8) In oral healthcare, preventative actions should receive higher priority than treatments.
9) The NHS should not prioritise oral health. Individuals are responsible for their own oral health.
10) Wealthier people should pay privately for their own oral healthcare. They are not dependent on the NHS for their oral health.

Appendix item K: Free-text comments to survey pilot

- Relatively easy to answer the questions
- If there is an opportunity to go back on questions that would be helpful. I did complete this on my phone as I didn't have a larger screen available so this may have been why I couldn't go back. A bit more of an explanation to the dentistry gap would also be helpful to understand the tables better
- I would say some of the questions I definitely needed to read more than once.
- Interesting - but took longer than 5 mins - perhaps need to say takes 10-15 when seeking participants
- In the first set of questions is could be useful to add an option to indicate you have not lost any adult teeth, or maybe re-word the two existing options slightly
- Patients should be treated equally and educated on how to look after their oral health.

Appendix item L: Responses by distributional judgement

Neutral framing			
	Frequency	Percent	Cumulative frequency
Pro-rich	102	17.89	17.89
Health Maximiser	195	34.21	52.11
Weighted Prioritarian	200	35.09	87.19
Maximin	12	2.11	89.30
Egalitarian	61	10.70	100
Socioeconomic framing			
Pro-rich	93	16.23	16.23
Health Maximiser	155	27.05	43.28
Weighted Prioritarian	217	37.87	81.15
Maximin	22	3.84	84.99
Egalitarian	86	15.01	100

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