Item 5.5

Public Health England

NHS England

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Orthodontics needs assessment for Leicestershire, Lincolnshire and Rutland

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Executive summary

This report provides an assessment of the need for orthodontic services across Leicestershire, Lincolnshire and Rutland. It describes the normative needs and existing demand for orthodontic treatment, and also matches capacity to estimated need.

Data on need for orthodontic services is necessary to inform long-term decisions on future orthodontic commissioning. Using the most recent available estimates from the Office for National Statistics (ONS) of the 12-year-old population in Leicestershire, Lincolnshire and Rutland, normative need for orthodontic treatment was calculated in a variety of methods. The mean of these methods (Table 9) showed that 6,956 cases of orthodontic treatment are required to be commissioned, by primary and secondary care services combined, to meet the estimated normative needs of the current 12 year-old resident population of this area, in a year and 4,857 cases of orthodontic treatment to meet the normative needs of the current child population accessing NHS Dentistry in the area.

In 2015/16, there were 12 Personal Dental Services (PDS) contracts in the area limited to the provision of orthodontic services and 34 mixed General Dental Services (GDS) contracts that included an orthodontic element. A total of 94,009 units of orthodontic activity (UOAs) were contracted across the area. The amount of UOAs within mixed GDS contracts was 29,033 UOAs.

In secondary care in 2015/16, the number of case starts has has been estimated as being between 579 (using all multi-disciplinary tariff), and 835 (using single professional tariff).

For 2015/16, the value of the primary care orthodontic contracts was £5.9 million, plus an additional spend of £1.1 million in Orthodontic Pathway contracts and a further £1.4 million spent on hospital orthodontic activity.

Waiting times for assessment and for treatment in primary care range from 0 to 2-3 years, based on data submitted for quarter 4 2015/16 the average wait time for assessment was 15 weeks and treatment was 25 weeks. There were also 2 orthodontic practices currently operating a closed list and therefore not accepting referrals and 4 mixed contracts not accepting external referrals.

The maximum waiting time for non-urgent consultant-led treatments is 18 weeks from the day the appointment is booked through the NHS e-Referral Service, or when the hospital or service receives your referral letter.

When capacity was matched to need, 70% of case starts were available in the area in primary care alone (100% of case starts were available when matched with the demand based on child access rates for NHS Dentistry in the area). Matching commissioned UOAs in primary care showed that 13.5 UOAs were available per case of normative need (19.4 UOAs were available per case when matched with the need based on child access rates for NHS Dentistry in the area). This did not take into account cases commissioned through the orthodontic care pathway which are not commissioned by UOAs. Factoring in an unqualified private market, NHS hospital orthodontic service provision and cases with unstable dental caries considered inappropriate for commencement of orthodontic care, this would suggest that the 70% NHS coverage is appropriate when normative based on percentage children accessing NHS dentistry providing good availability or orthodontic services across the area. But is inappropriate when based on normative need alone. However, it may be necessary to consider factors in the individual local authority areas such as patient flows and waiting times.

Data showed there were more patients from Leicestershire, Lincolnshire and Rutland going outside the area for orthodontic treatment than patients from other areas coming into Leicestershire, Lincolnshire and Rutland for orthodontic treatment. Local access to orthodontic services is unevenly distributed across the area.

As a result of this needs assessment, NHS England may wish to consider the following:

- further work to understand the reasons for the gap between normative need and demand
- supporting and advising on the collection of detailed analysis of hospital orthodontic services for the area, including a consistent way of reporting orthodontic activity for each trust; This could be done through a CQUIN. This will provide a more accurate data on those undergoing orthodontic treatment in hospitals
- ensure that primary, care pathway and hospital orthodontic contracts provide value for money and quality in outcomes
- undertake a sample audit of referrals for orthodontic treatment sent to the Dental Referral Management Centre
- work with orthodontic practices and Orthodontic MCN to agree a process for validating waiting times and ensuring process of prioritisation of cases based on patient need
- supporting further development of managed clinical networks across Leicestershire, Lincolnshire and Rutland as described in the Orthodntic Commissioning Guide
- ensuring that future commissioning arrangements support equitable access to orthodontic services

1. Introduction

The majority of orthodontic treatments are delivered either under time-limited contracts Personal Dental Services (PDS) agreements or included within a General Dental Service (GDS) contract for general and orthodontic services which were introduced in 2006. Guidance issued by the Department of Health (DH) in 2010 suggested specific consideration to be taken into account by commissioners prior to making decisions on the future of these service. Most primary care trusts (PCTs) extended contracts for up to two years and the agreements ended in 2013. Currently NHS England commissions primary care dental services including orthodontic services via the local office teams.

Commissioners need to make long-term decisions on the future of these contracts. A key factor in determining the future of orthodontic capacity is an assessment of the level of services to be commissioned to meet the population need. While the distribution of orthodontic services in the area is still mainly based on historical provision that existed prior to the 2006 dental contract, commissioners should be able to better target resources over time, based on needs and to ensure equity of orthodontic service provision.

Currently PDS agreements have been extended to the end of September 2017 by the application of a single tender action waiver that was approved by NHS England. NHS England has previously applied the quality and values outcome audit to enable the extension of PDS agreements in 2013/14.

This report is an assessment of the need for orthodontic services across Leicestershire, Lincolnshire and Rutland. It describes the current and projected normative needs together with existing demand for orthodontic services. It provides information on current commissioned and delivered orthodontic activity, waiting times and examines orthodontic patient flows in and out of the area. The report concludes with an assessment of whether the services commissioned are meeting need.

Over the past 10 years, the cost of orthodontic treatment in general and personal dental services has been estimated to have increased and accounts for about 9.4% of the total primary care budget for England is accounted for by orthodontic related activity. By mapping provision, need and using local knowledge it is expected that this needs assessment will help guide commissioners to maintain an equitable and sustainable orthodontic service in across Leicestershire, Lincolnshire and Rutland.

2. Background and available guidance

The current arrangements for the commissioning of specialist orthodontic services in primary care came into operation in April 2006. A number of published documents recommend a range of actions for PCTs to establish a more strategic and effective approach to orthodontic commissioning. These documents suggested moving to a sector-wide approach, commissioning orthodontics across primary and secondary care and assessing levels of orthodontic need as the basis for planning appropriate future capacity and developing clinical governance.

Further guidance explored joint commissioning of orthodontics in line with local needs, issues concerning future UOA values and benchmarking ratios between assessments and case starts. 'Quality assurance in NHS primary care orthodontics' provided further details of the proposed quality assessments and outcome framework together with compliance required by national regulations.

In September 2015, NHS England published Guides for commissioning dental specialities, one of which was for orthodontics[1]. This document was for commissioners to use to offer a consisitent and coherent approach to commissioning orthodontic services, to improve outcomes for patients, ensure highest quality of care in the most appropriate setting, by professionals with the required skills and ensuring value for money.

Key documents related to orthodontic commissioning are:

- Department of Health (2005) guidance 'Primary dental services: commissioning specialist dental services (revised version)' gateway 5865[2]
- Department of Health (2006) 'Strategic commissioning of primary care orthodontic services'. Gateway 7105[3]
- Primary Care Contracting (2006) 'New orthodontic contracts, hints and tips'[4]
- PCC guidance November 2007 'Quality assurance in NHS primary care orthodontics'[5]
- Securing excellence in commissioning NHS dental services[6] 2013
- Transitional commissioning or primary care orthodontic service[7] 2012
- Commissioning Guide for Orthodontics[8]

Delivery of orthodontic activity

General dental practitioners, dentists with enhanced skills and orthodontic specialists, deliver primary care orthodontic services. They are, in some cases, supported by orthodontic therapists. Secondary care orthodontics is delivered by consultants and

specialists within hospital settings assisted in some places by trainees. Secondary care orthodontists offer advice, training and treat the most complex cases.

3. Measuring orthodontic treatment need

Review of literature

The literature on orthodontic need draws a number of conclusions regarding the types of need, who is eligible for orthodontic treatment and what motivates patients to seek orthodontic treatment. The conclusions are summarised below:

- there may be differences between normative and perceived needs for orthodontic treatment
- there may be discrepancies ibetween professionals opinion of orthodontic need and parents and children's opinion of need[91011]
- normative or professionally defined need is usually measured via the Index of Orthodontic Treatment Need or the IOTN
- children classified with an IOTN score of 3.6 or above are eligible for NHS orthodontic treatment in primary care. Brook and Shaw[12] reported that 39% of the 11-12 year population fell into this category
- cases who have a normative/professionally defined need may not seek treatment, conversely patients who are not defined as having a normative need may still request or have treatment[13]
- to try to factor this into measures for orthodontic treatment need it has been suggested that IOTN should be combined with subjective measure such as Oral Health Related Quality of life or Index of Complexity, Outcome and Need (ICON)[14]
- children may be more motivated to seek care if they are teased about the appearance of their teeth [15]
- children are less likely to have treatment if there are fewer orthodontists in an area. Socially deprived children do not appear to be disadvantaged in terms of receiving orthodontic treatment[16]
- a low dentist-to-patient ratio can be a predictor for increasing need for orthodontic services, as there is an increased dental awareness[17 18]
- orthodontic treatment needs are multifactorial and must take into account motivation, attitude, health risks, costs, duration of treatment and prognosis[19]
- failure rate during orthodontic treatment has been reported as 12-17%, failure is due to patient noncompliance, incorrect diagnosis and incorrect management[18]

Methods of assessing orthodontic treatment needs

There are three main elements to assessing orthodontic treatment need:

- **Normative need** the actual professionally judged need in a population cohort as defined following a clinical examination using a standardised clinical index such

as IOTN or benchmark and/or need defined by applying a validated formula (Stephen's formula). This represents the capacity to benefit from healthcare
- **Subjective** or **perceived need** by the individual
- **Demand, expressed need** that is presented for treatment

Twelve-year-olds are used as the age group to define need, as orthodontic treatment is usually carried out when all permanent teeth have erupted; the amount of orthodontic treatment in the younger and older age groups is low. The average age of starting treatment in the 2003 Child Dental Health survey was 12.7 years[20].

There are different formulae to assess orthodontic need, a selection of methods are used in this assessment. The methods include :

- Child Dental Health survey method
- Stephen's formulae
- Holmes method
- The NHS dental epidemiology programme survey of 12-year-olds in 2008/09 method

In addition to measuring treatment need, an audit of providers and the services they provide may provide additional invaluable information. This should be done by assessing excellence using a framework that measures quality and value. The location and provision of services should also be reviewed.

Estimating orthodontic need using the formula based on 2013 National Child Dental Health Survey

The National Child Dental Health Survey (CDHS) 2003 showed that 35% of 12-year-old children in the UK had an IOTN score of 3.8 or above, this was based on the dental health grounds and aesthetic grounds, a combination or individually[21].

Regarding parental views, 42% of parents of 12-year-olds with a clinically judged malocclusion felt that their children's teeth needed straightening on dental health grounds. Fifty-two percent of parents of 12-year-olds felt that their children required orthodontic treatment for aesthetic reasons[22].

The National Child Dental Health Survey (CDHS) 2013 showed that 37% of 12 year olds in England had unmet need (dental health component or aesthetics 8 – 10). However no account was taken of demand[23].

Table 1 Assessment of need for orthodontic treatment using the assessment from the Child Dental Health Survey (2013)

	12 year old population 2016 (based on 2011 census)	Normative need 37% of 12-year –old population	%Children accessing NHS dentistry* per LA in previous 24 months to 31st March 2016	Normative need of children accessing dental care
Leicester City	4,154	1,537	80.9	1,243
Leicestershire	7,590	2,808	68.2	1,915
Rutland	452	167	78.1	130
Lincolnshire	7,530	2,786	64.5	1,797
Total	19,726	7,298	N/A	5,085

* Data is from NHS Digital and is percentage of child patients seen in the previous 24 months as a percentage of the population Local Authority

Table 2 Future assessment of need for orthodontic treatment using the assessment from the Child Dental Health Survey (2013) for 2026 projected population

	12 year old population 2026 (based on 2011 census)	Normative need 37% of 12-year –old population	%Children accessing NHS dentistry* per LA in previous 24 months to 31st March 2016	Normative need of children accessing dental care
Leicester City	4,788	1,772	80.9	1,434
Leicestershire	7,998	2,959	68.2	2,018
Rutland	522	193	78.1	151
Lincolnshire	8,795	3,254	64.5	2,099
Total	22,103	8,178	N/A	5,702

* Data is from NHS Digital and is percentage of child patients seen in the previous 24 months as a percentage of the population Local Authority

Estimating orthodontic need using Stephen's formula

The Stephen's Formula involves assessing need from the Dental Health Component (DHC) categories 4 and 5 of the index of Orthodontic Treatment Need (IOTN)[24], and in a typical school population one third of children fall into these categories. Only a proportion of those with a DHC 3 will justify treatment. Using Stephens' formula, it is assumed that a proportion of those in category 4 and 5 who despite a need for treatment will decline, this offsets those in category 3 that require treatment.

Stephen's formula includes additional factors for those who require early treatment (interceptive treatment) (9%) and for the treatment of adults (4%). The number of 12 year olds is used, as a proxy for treatment needs.

Stephens' Formula can be expressed as:

$$\frac{\text{12 year old population}}{3} \times \frac{100 + \text{Interceptive factor (9)} + \text{Adults (4)}}{100} =$$

$$\frac{\text{12 year old population}}{} \times 1.13$$

Table 3: Estimating orthodontic need using the Stephen's formula for 2016

	12 year old population 2016 (based on 2011 census)[25]	Orthodontic need based on Stephens formula	%Children accessing NHS dentistry* per LA in previous 24 months to 31st March 2016	Orthodntic need based on % children accessing NHS dentistry
Leicester City	4,154	1,565	80.9	1,266
Leicestershire	7,590	2,859	68.2	1,950
Rutland	452	170	78.1	133
Lincolnshire	7,530	2,836	64.5	1,829
Total	19,726	7,430	N/A	5,178

* Data is from NHS Digital and is percentage of child patients seen in the previous 24 months as a percentage of the population Local Authority

Table 4: Estimating orthodontic need using the Stephen's formula for 2026

	12 year old population 2026 (based on 2011 census)	Orthodontic need based on Stephens formula	%Children accessing NHS dentistry* per LA in previous 24 months to 31st March 2016	Orthodntic need based on % children accessing NHS dentistry
Leicester City	4,788	1,803	80.9	1,459
Leicestershire	7,998	3,013	68.2	2,055
Rutland	522	197	78.1	154
Lincolnshire	8,795	3,313	64.5	2,137
Total	22,103	8,326	N/A	5,805

* Data is from NHS Digital and is percentage of child patients seen in the previous 24 months as a percentage of the population Local Authority

Estimating orthodontic need using Holmes method

Holmes[26] estimated that 36.3% of 11-12 year olds had an IOTN 3 and AC 6 or higher. The results of applying this proportion to the 12 year old population data across the Area can be seen in table 2.

Table 5: Estimating orthodontic need using the Holmes method for 2016

	12 year old population 2016 (based on 2011 census)	Orthodontic need based on Holmes formula	%Children accessing NHS dentistry* per LA in previous 24 months to 31st March 2016	Orthodntic need based on % children accessing NHS dentistry
Leicester City	4,154	1,508	80.9	1,220
Leicestershire	7,590	2,755	68.2	1,879
Rutland	452	164	78.1	128
Lincolnshire	7,530	2,733	64.5	1,763
Total	19,726	7,160	N/A	4,990

* Data is from NHS Digital and is percentage of child patients seen in the previous 24 months as a percentage of the population Local Authority

Table 6: Estimating orthodontic need using the Holmes method for 2026

	12 year old population 2026 (based on 2011 census)	Orthodontic need based on Holmes formula	%Children accessing NHS dentistry* per LA in previous 24 months to 31st March 2016	Orthodntic need based on % children accessing NHS dentistry
Leicester City	4788	1,738	80.9	1,406
Leicestershire	7998	2,903	68.2	1,980
Rutland	522	189	78.1	148
Lincolnshire	8795	3,193	64.5	2,059
Total	22,103	8,023	N/A	5,593

* Data is from NHS Digital and is percentage of child patients seen in the previous 24 months as a percentage of the population Local Authority

Estimating clinical and perceived orthodontic need 2016 using the NHS 12-year-old Dental Health Survey 2008/09

Table 7 : Estimating clinical and perceived orthodontic need 2016 using the NHS 12-year-old Dental Health Survey 2008/09[27]

	12 year old 2016 population (based on 2011 census)	% of Children examined already wearing a brace	Children currently not wearing a brace		Total need and demand	Translated to numbers	%Children accessing NHS dentistry* per LA in previous 24 months to 31st March 2016	Number that will access orthodontic treatment
			Need – Children with IOTN DHC = 3 or AC = 8,9,10	Need and demand - Children with IOTN DHC = 3 or AC = 8,9,10 who think their teeth need straightening and are prepared to wear a brace				
Leicester City	4,154	8%	46.7%	27.7%	35.7%	1,483	80.9	1,200
Leicestershire	7,590	8.3%	40.8%	21%	29.9%	2,269	68.2	1,547
Rutland	452	8.3%	40.8%	21%	29.9%	135	78.1	105
Lincolnshire*	7,530	7.9%	31.6%	19.3%	27.2%	2,048	64.5	1,321
Total	19,726					5,935		4,173

Table 8 : Estimating clinical and perceived orthodontic need 2026 using the NHS 12-year-old Dental Health Survey 2008/09

	12 year old 2026 population (based on 2011 census)	% of Children examined already wearing a brace	Children currently not wearing a brace		Total need and demand	Translated to numbers	%Children accessing NHS dentistry* per LA in previous 24 months to 31st March 2016	Number that will access orthodontic treatment
			Need – Children with IOTN DHC = 3 or AC = 8,9,10	Need and demand - Children with IOTN DHC = 3 or AC = 8,9,10 who think their teeth need straightening and are prepared to wear a brace				
Leicester City	4,788	8%	46.7%	27.7%	35.7%	1,709	80.9	1,383
Leicestershire	7,998	8.3%	40.8%	21%	29.9%	2,391	68.2	1,631
Rutland	522	8.3%	40.8%	21%	29.9%	156	78.1	122
Lincolnshire*	8,795	7.9%	31.6%	19.3%	27.2%	2,392	64.5	1,543
Total	22,103					6,648		4,679

Qualification of orthodontic treatment need

Table 9 summarises the different needs calculations for the different methods, and the mean of these methods for Leicestershire, Lincolnshire and Rutland.

Table 9 : Summary of methods of assessing normative need and average for the area on population data for 2016

Summary of normative need calculations and mean for area		
Method of calculation	Normative clinical need	Normative clinical need taking account of percentage of child population that has visited NHS dentist
Child Dental Health survey (2013) method	7,298	5,085
Stephen's formula	7,430	5,178
Holmes method	7,160	4,990
NHS 12-year-old survey 2008/09	5,935	4,173
Average	6,956	4,857

Table 10 : Summary of methods of assessing normative need and average for the area on population data for 2026

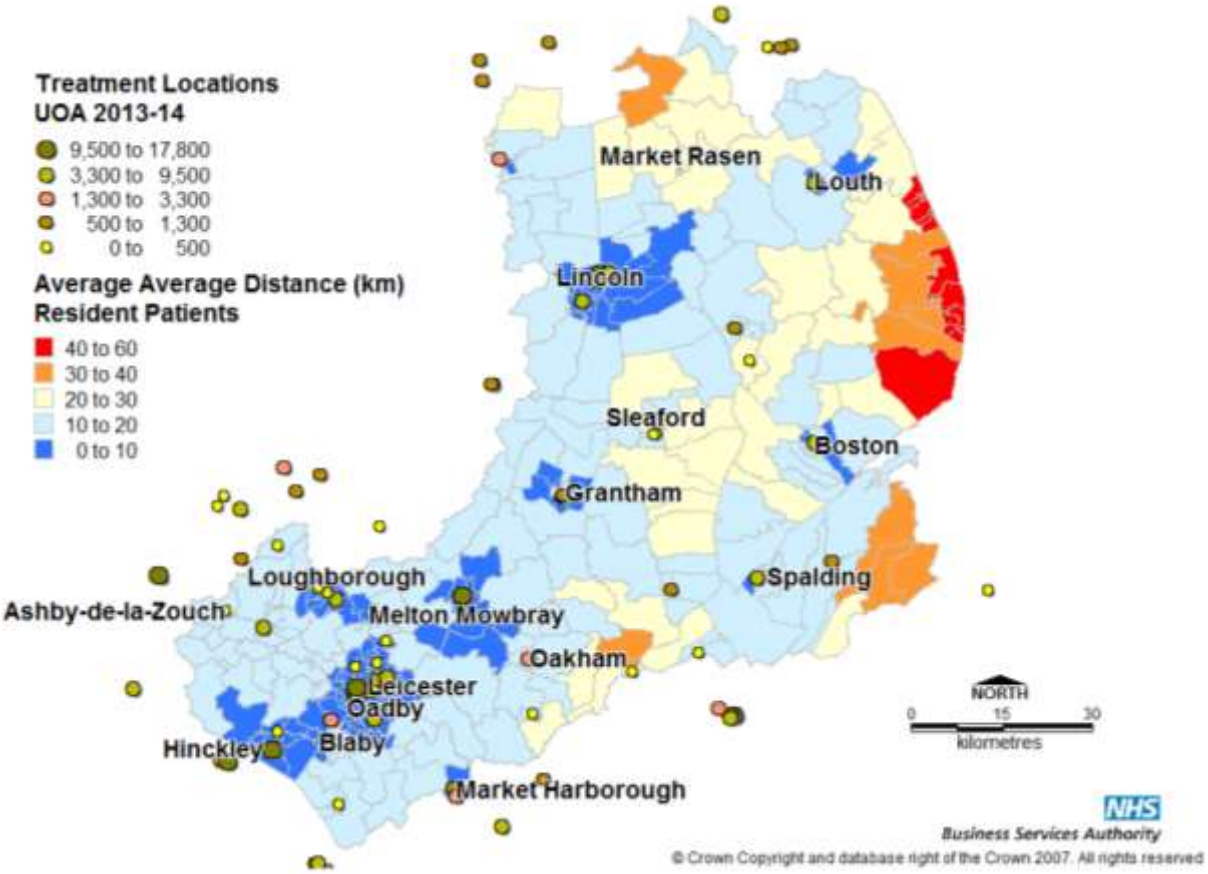
	Summary of normative need calculations and mean for area	
Method of calculation	Normative clinical need	Normative clinical need taking account of percentage of child population that has visited NHS dentist
Child Dental Health survey (2013) method	8,178	5,702
Stephen's formula	8,326	5,805
Holmes method	8,023	5,593
NHS 12-year-old survey 2008/09	6,648	4,679
Average	7,794	5,445

The geographical pattern of treatment locations can help assess the effectiveness of dental commissioning, especially when combined with other data such as population and resident patient rates.

Treatment location is the address where the treatment took place. Treatment locations were selected for a 12 month period for contracts located in the analysed area. The reasoning behind selecting treatment locations rather than practice locations is that for some contracts these locations can be different, therefore treatment locations reflect best to where patients actually receive dental treatment. Data based on 12 months to March 2014.

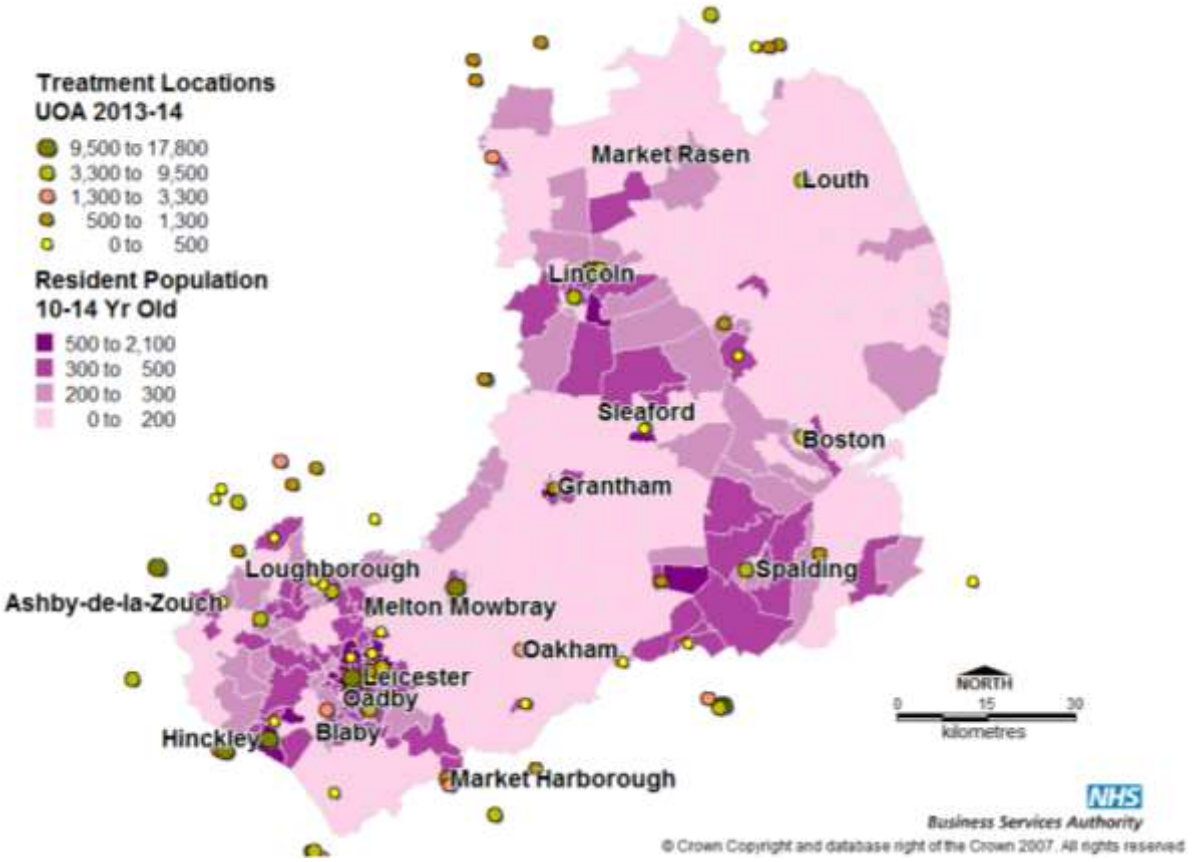
The map below shows treatment locations overlaid onto average distance travelled at ward level. The aim is to show the effectiveness of dental commissioning in relation to areas where patients travel furthest. Those locations with the highest levels are shown with the larger symbols on the map and main towns are shown for geographical reference.

Map 1: Delivered UOA Treatment Locations (12 months to March 2014) & Average Distance Travelled by of resident patients attending NHS orthodontist (24 months to March 2014)



Map 2 below shows treatment locations overlaid onto ward level population for 10-14 year olds (source: 2012: population and household estimates for Wards in England and Wales, ONS). The aim is to show the effectiveness of dental commissioning in relation to the key population group for orthodontic activity.

Map 2: Delivered UOA Treatment Locations (12 months to March 2014) & 10-14 Year Old Population



Population growth

By 2026, the population of 12-year-olds is set to grow from 19,726 to 22,103[28], a 12% rise. This suggests that need may increase by an estimated 12%.

Other factors to consider in estimating orthodontic treatment needs

Orthodontic services are mainly provided on a referral basis from General Dental Practitioner after assessment. On 31st March 2016 an estimated 80.9% of children in Leicester City, 68.2% of children in Leicestershire, 64.5% in Lincolnshire and 78.1% in Rutland visited an NHS dentist in the previous 24 months.

Therefore, not all children will be assessed and referred for orthodontic care if required. In addition, those attending may not perceive a need for treatment even if clinically indicated. Children who are referred for orthodontic treatment should be dentally fit, free from active decay and have good oral hygiene. Across the area on average, 55.7% of

12-year-old children in Leicester City, 42.2% of 12-year-old children in Leicestershire have active and untreated tooth decay[29]. There is no data available for Lincolnshire as they did not participate in this survey.

4. Understanding orthodontic service provision

Primary care orthodontic services

In Leicestershire, Lincolnshire and Rutland, there are 46 NHS primary care orthodontic contracts open. 34 are General Dental Services (GDS) mixed orthodontic contracts and 12 are Personal Dental Services (PDS) agreements limited to the provision of orthodontics. Primary care orthodontic contracts (including the orthodontic component of mixed contracts) totalled a spend of £7 million, which amounts to 9.14% of all primary care dental across Leicestershire, Lincolnshire and Rutland for 2015/16. Data on the orthodontic component of mixed contracts showed that the total contract value was £1.9 million for 2015/16.

There were a total of 94,009 UOAs contracted across, Leicestershire, Lincolnshire and Rutland in 2015/16 in the primary care sector (see table 11 below). It should also be noted that an additional amount of £2.2 million has been spent previously on non-recurrent activity in late 2014/15, an additional 35,087 UOAs was provided to reduce the number of patients waiting and waiting times over 2014/15 and into 2015/16.

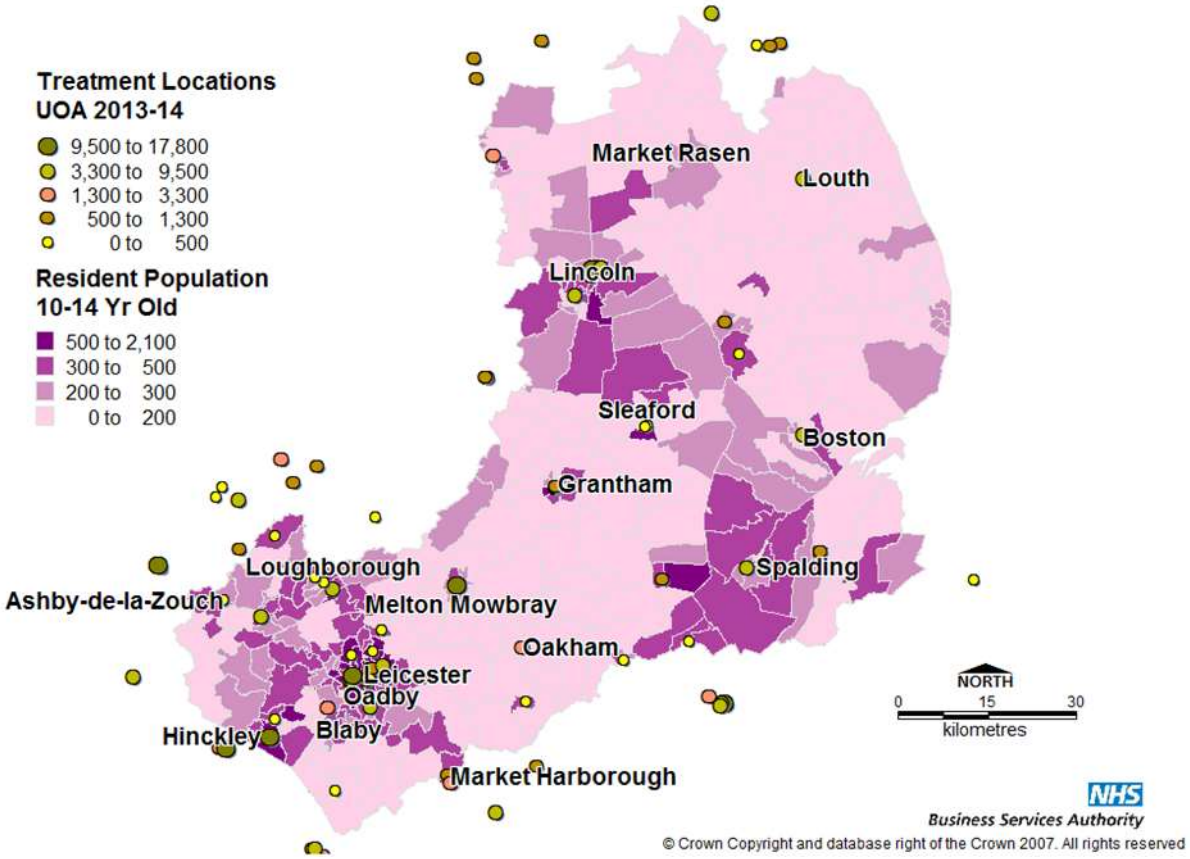
Table 11: Recurrent UOAs contracted in Primary Care 2015/16

2015/16			**General Contracts**		**Orthodontic Only Contracts**	
Area	Number of mixed contracts	Number of Orthodontic only contracts	Number of UOAs	Value	Number of UOAs	Value
Leicester City	10	2	9,691	£624,857.32	14,584	£882,002.94
Leicestershire & Rutland	8	6	3,557	£228,670.04	31,787	£1,991,623.83
Lincolnshire	16	4	15,785	£1,037,025.80	18,605	£1,155,521.39
Total	**34**	**12**	**29,033**	**£1,890,553.16**	**64,976**	**£4,029,148.16**

Table 11 shows that there are 29,033 UOA within general contracts and 64,976 within orthodontic only contracts. This gives a total of 94,009 UOAs commissioned in primary care. To estimate number of case starts we need to divide by 22, which gives an estimate of 4,273 case starts.

Map 3 shows the treatment locations and the size of the contracts. The shading represents the population of 10-14-year-olds at ward level.

Map 3: Delivered UOA Treatment Locations (12 months to March 2014) & 10-14 Year Old Population



Orthodontic care pathways in Leicester, Leicestershire and Rutland

The orthodontic pathway In Leicester, Leicestershire and Rutland was reviewed in 2008/2009 to analyse the change in demand for the service and to see if changes to the pathway were required. After review it was agreed to have a new pathway, for the treatment of some patients who would traditionally have been treated in a hospital with a choice of providers across the local area. There are 8 Orthodontic Pathway PDS agreements. During 2015/2016 the Orthodontic Pathway contracts delivered 589 courses of orthodontic treatment.

Hospital orthodontic services (Secondary Care)

Hospital orthodontic services delivered by consultant led teams are commissioned as part of contracts with secondary care providers forming an established part of NHS England baseline funding for acute sector services.

There are two hospital trust providers in Leicestershire, Lincolnshire and Rutland, University Hospitals of Leicester NHS Trust and United Lincolnshire Hospitals NHS Trust. A number of residents in the area are also treated in acute trusts that are outside the area such as Peterborough Hospital and Burton Hospital.

Most referrals to the hospital service will be from the Orthodontic Pathway providers in Leicestershire and from GDPs, Salaried Dental Services and from specialists in Lincolnshire. Cases treated in secondary care are usually the more complex cases, and those requiring multi-disciplinary input.

Secondary Care expenditure

Total cost of Secondary Care Orthodontic services for resident patients in each county is shown in the table below

Table 12: Total cost of Secondary Care Orthodontic services for Leicestershire, Lincolnshire and Rutland

	14/15	15/16	16/17
	Cost	Cost	Cost*
Lincolnshire	£1,241,506.90	£1,254,043.65	£768,793.48
Leicestershire	£406,134.68	£112,757.68	£66,204.06
Total	£1,647,641.58	£1,366,801.33	£834,997.54

*Part year effect information only up to M8

Estimate of hospital service cost per case and numbers treated

It should be stated this report does not yet include actual numbers of orthodontic cases treated in secondary care but an estimate.

Secondary care dental services are commissioned for the resident population who may seek treatment at any provider trust, with a recharge back to the host NHS England on Payment by Results (PbR) tariff. Hospital tariffs for orthodontic treatment in secondary care are set at national level. The estimates used in this document are based on first attendance and follow up attendance for multi-professional, however some cases will be charged on a single professional lower tariff price too therefore this estimate has also been calculated..

Orthodontic cases take approximately 18 months to treat. The cost estimates for this work are based on the following number of appointments:

1st appointment

6 weekly appointments over 18 months (78 weeks / 6 = 13) 13 x follow up appointments

2 repair visits (2 follow ups)

1 visit to fit retainers (1 follow up)

3 visits for supervised retention (3 follow up visits)

In summary each hospital case has been costed as 1 first appointment plus 19 follow up appointments. If national tariff for multi-disciplinary is used for first appointment and follow up attendences then a course of treatment would cost £2,360. If national tariffs for single professional for first attendance and follow up attendance, the cost per case would be £1,637

Using this calculation, for 2015/16 the number of cases in hospital using all multi-disciplinary tariff would be 579, and if using single professional tariff would be 835.

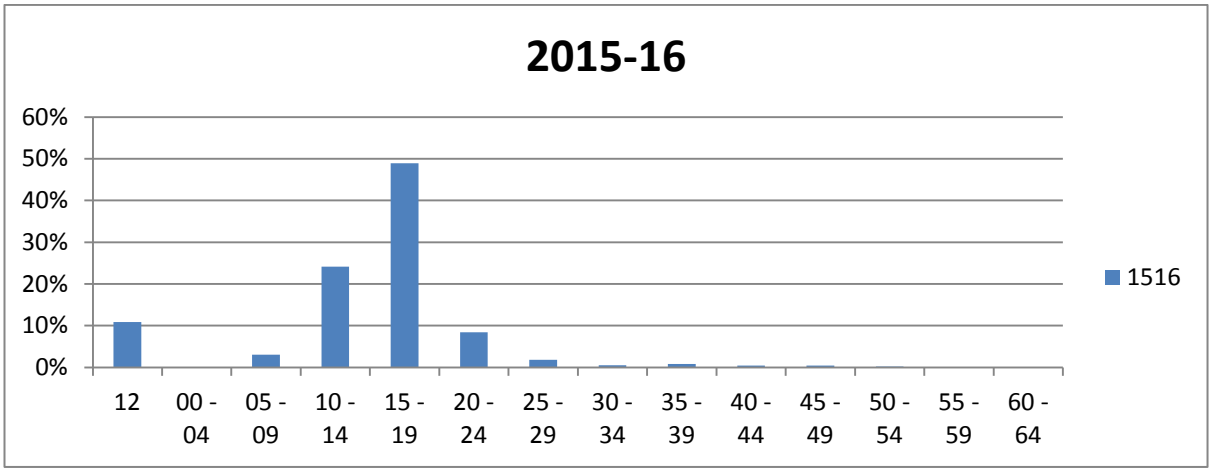
Table 13 below details the percentage of unique patients accessing Hospital Orthodontic Treatment based on patients CCG in 2015/16

Table 13: Percentage of unique patients accessing Hospital Orthodontic Treatment based on patients CCG in 2015/16

CCG	Orthodontics 2015/16
Lincolnshire East CCG	24.6%
Lincolnshire West CCG	20.2%
South Lincolnshire CCG	9.1%
South West Lincolnshire CCG	22.3%
East Leicestershire and Rutland CCG	7.0%
West Leicestershire CCG	10.1%
Leicester City CCG	6.7%

Figure 1 shows the split by age of patients having orthodontic treatment during 2016/2017. It demonstrates that 87.5% of those attending hospital orthodontic services where aged 19 or below. Patients undergoing orthognathic surgery need to have completed growth before treatment can start. Therefore this group of patients will not start orthodontic treatment until after the age of 18.

Figure 1: The percentage split by age for Leicestershire and Lincolnshire patients



Estimating capacity

Table 11 shows that there are 29,033 UOA within general contracts and 64,976 within orthodontic only contracts. This gives a total of 94,009 UOAs commissioned in primary care. To estimate number of case starts we need to divide by 22, which gives an estimate of 4,273 case starts. The data for orthodontic care pathway cases shows that during 2015/2016, 589 courses of orthodontic treatment were provided. This gives a total of 4,862 case starts during 2015/2016. This would meet the normative need (clinical need) taking account of percentage of child population that has visited NHS dentist and would meet 70% of the normative clinical need.

The number of cases in hospital using all multi-disciplinary tariff would be 579, and if using single professional tariff would be 835. This gives a range between 5,441 and 5,697 case starts. This would cover 78% to 82% or normative clinical need.

Workforce

We have not included workforce in this needs assessment, as the secondary care Trust in Leicestershire is currently in transition with locum and external support, and as such does not demonstrate an accurate reflection of the departments.

Assessments and treatments in primary care

Figure 2 demonstrates the proportion of assessments with the subsequent decision to start treatment. A high proportion of assessments with a decision to provide treatment are arguably more efficient than a high proportion of assessments that are not. A low proportion may indicate poor value for money where assessment is not being translated into treatment. This information should be considered in conjunction with local knowledge. The outcome is shown as a proportion of all assessments in the analysed period based on patient's residence. The patient's residence is determined by the postcode recorded in the personal details section of each FP17O submitted. Data has been extracted for 12 month up to March 2014. As some

practices do not submit FP17O for orthodontic assessments the data in figure 1 may not be accurate.

Figure 2: Percentage of assessments that were 'assess and fit appliance' (12 months to March 2014) (Source NHSBSA)

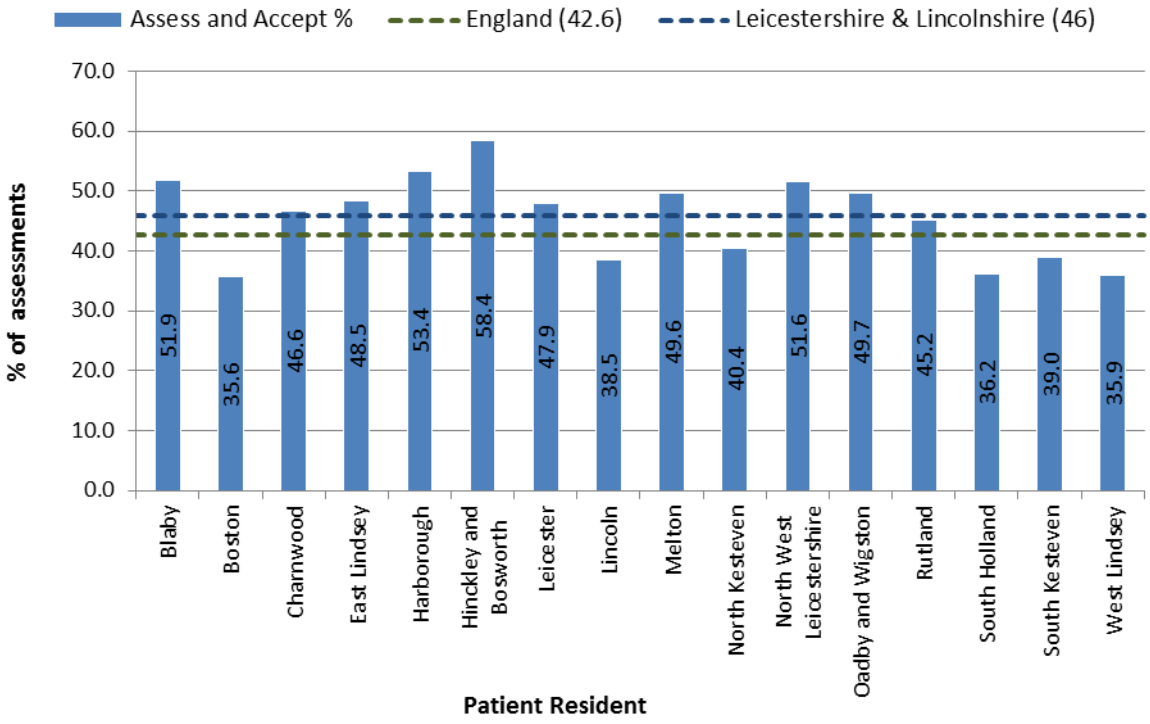
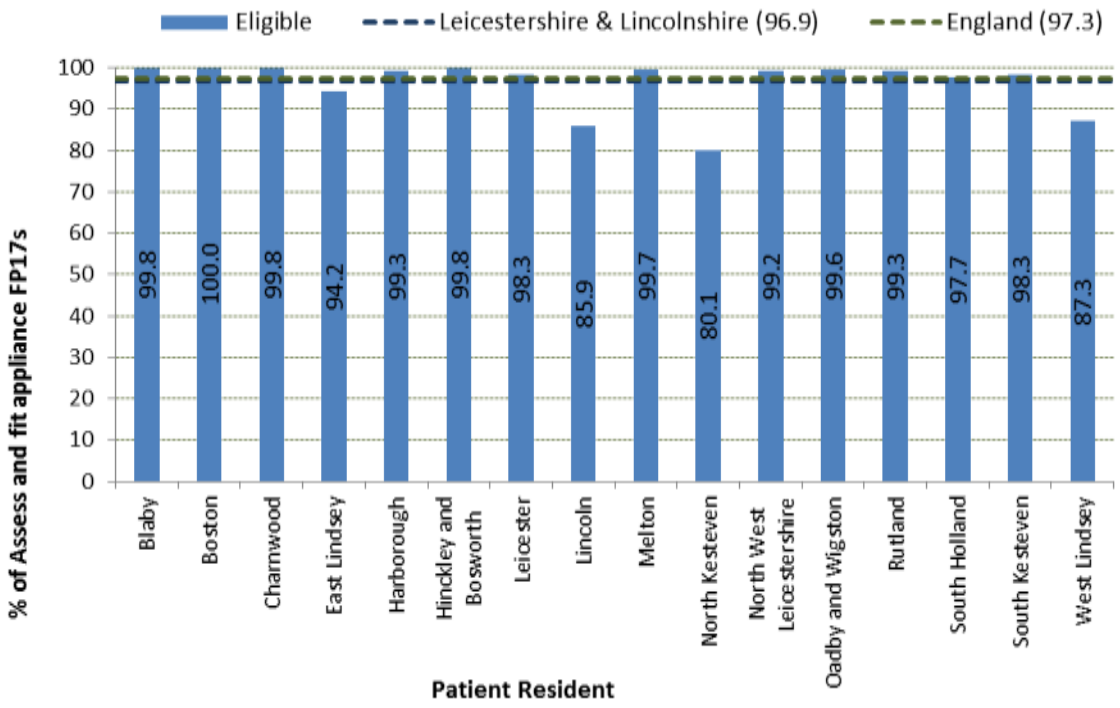


Figure 3 is an indicator of the eligibility of cases accepted for treatment using the IOTN assessment. A low percentage indicates that not all cases accepted were eligible for treatment using IOTN method of assessing need.

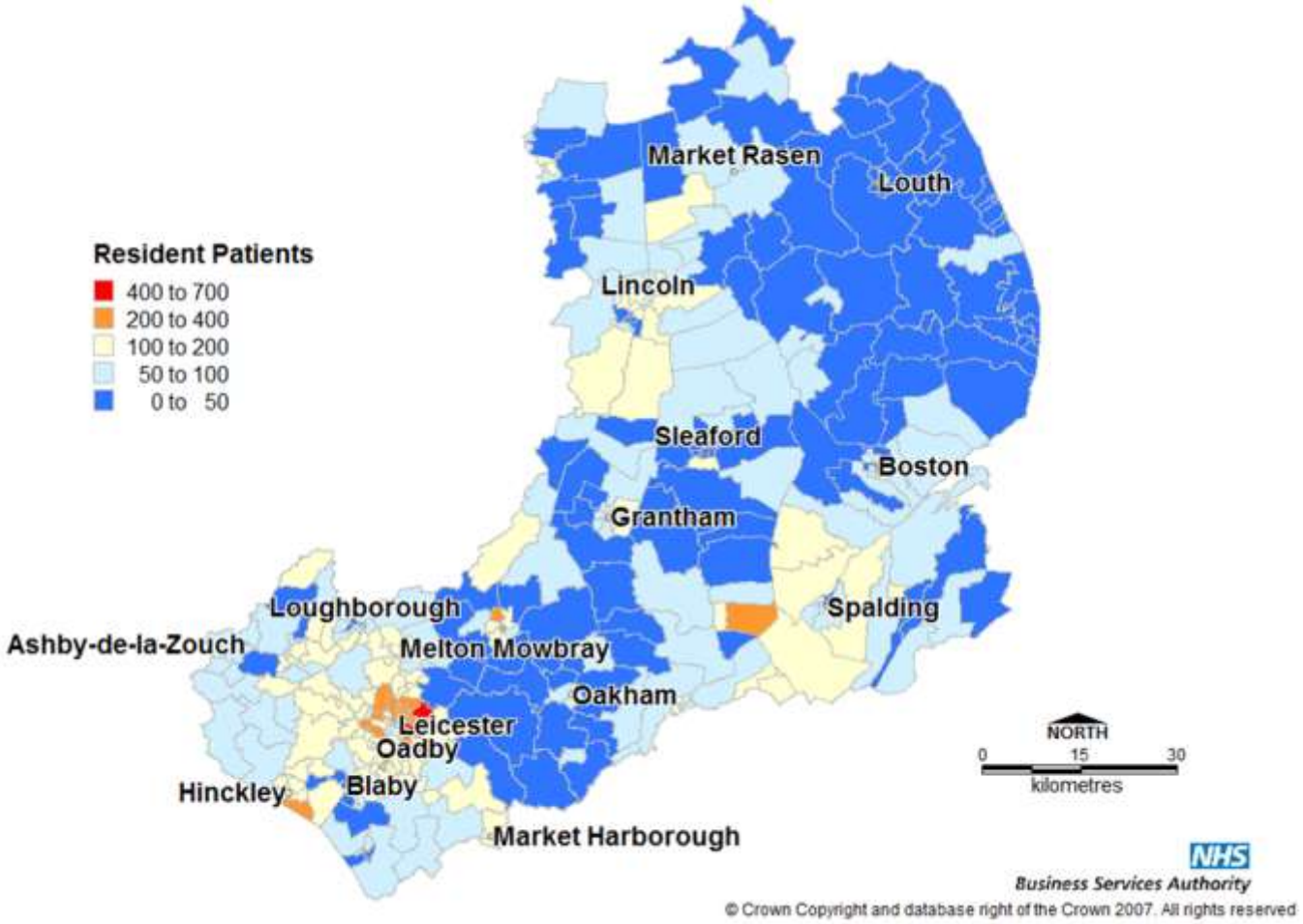
Figure 3: Percentage of assess and fit appliance FP17s where the IOTN was eligible (Source NHSBSA)



Resident population attending a dentist (primary care orthodontic services)

Map 4 demonstrates the number of patients visiting an NHS orthodontist; the red and orange areas are an indicator of more patients accessing service therefore greater demand. The map shows that the highest areas of demand are in Leicester City in the following wards, Spinney Hills and Humberstone and Hamilton. The next higest areas of demand are across the area and are, Bourne East, Melton Sysonby, Beaumont Leys, Abbey, New Parks, Braunstone Park and Rowley Fields, Rushey Mead, Belgrave, Latimer, Charnwood, Coleman, Thurncourt, Evington, Knighton, Eyres Monsell and Burbage Sketchley and Stretton.

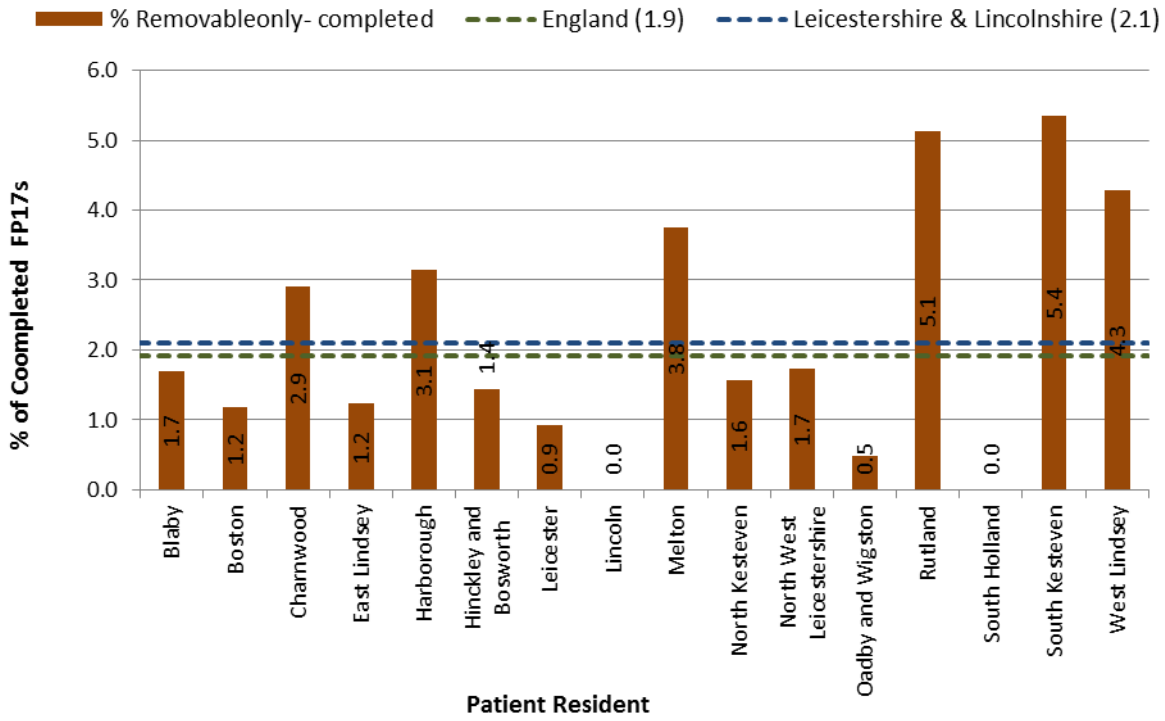
Map 4: Total resident patients attending NHS orthodontist (24 months to March 2014) (Source NHSBSA)



Treatment

Figure 4 demonstrates the amount of courses of treatment carried out with removable appliances only. It is widely accepted that optimal orthodontic results are seldom obtained by using removable orthodontic appliances alone. A high proportion may represent poor technique, reduced efficiency and effectiveness and suboptimal outcomes for patients.

Figure 4: Percentage completed treatment with removal appliance only (Source NHSBSA)



Patient feedback

The NHS Dental Services send out patient satisfaction surveys to a random sample of case starts within one month of the date of the reported start. During 2015/2016, the BSA sent out questionnaires to between 2,000 and 3,000 patients per month.

A total of 2,326 orthodontic questionnaires were sent to patients treated in Leicestershire, Lincolnshire and Rutland between April 2014 and March 2016. The response rate was 32.5% (755 patients)

The majority of respondents (95.9%) received NHS treatment; a small proportion (1.7%) received a combination of NHS and private treatment. This gives an indication of private treatment levels but only for those who have also received NHS orthodontic treatment.

The satisfaction questionnaire survey shows that of the 755 patients that responded, the majority of patients (96.2%) were completely or fairly satisfied with their orthodontic treatment (Table 14). As the survey is sent within a month of reported start of orthodontic treatment, the results only relates to the beginning of orthodontic treatment.

Table 14: Patients satisfaction with dental treatment (Source NHSBSA)

Patient's satisfaction with dentistry received	Percentage (%)
Completely satisfied	76.8
Fairly satisfied	18.8
Fairly dissatisfied	1.7
Very dissatisfied	2.0
No response	0.4

Stakeholder engagement

Stakeholder engagement will be undertaken.This will include primary and secondary care providers, referring GDPs and patients.

There is on-going engagement with the Orthodontic Managed Clinical Network and updates are provided to the Local Dental Network (LDN) chair and the LDN Steering Group which includes representation from stakeholders including the Local Dental Committees, Local Authority, Health Education England and Healthwatch.

Funding for primary and secondary care

The total spend on primary and secondary care orthodontics in Leicestershire, Lincolnshire and Rutland for 2015/16 the total spend is £8.4m (£5.9m Primary Care, £1.1m Pathway and £1.4m Secondary Care).

Primary care orthodontic contracts (including the orthodontic component of mixed contracts and the Orthodontic Pathway contracts) totalled £7 million which amounted to 9.14% of send on all primary care dental services in Leicestershire, Lincolnshire and Rutland. Data on the orthodontic component of mixed contracts showed that the total contract value was £1.9 million.

The estimated annual spend for orthodontics in secondary care is estimated as £1.4 million.

The figures above show that the percentage spend on Secondary Care is 16.7% and Primary Care 83.3%.

Ethnicity

Since 2010 there has been a requirement for the recording of ethnicity on NHS primary care orthodontic forms (FP17O). One of the main reasons for recording ethnicity data is

to demonstrate whether there is equity of access to healthcare services across different ethnic groups. In Leicestershire, Lincolnshire and Rutland 73.1% of claims had ethnicity data recorded in 2013/14, 19.5% declined to answer and in 7.4% ethnicity was unspecified The ethnic profile of people receiving NHS primary care orthodontic services in Leicestershire, Lincolnshire and Rutland is shownin Table 15 below.

Table 15 Leicestershire, Lincolnshire and Rutland, ethnic breakdown of orthodontic patients 201504-201603

NHS ethnic monitioring description	Number of orthodontic patients treated	% Ethnic profile of orthodontic patients	Total % of ethnic profile of orthodontic patients	Census 2011 ethnic grouping	Total % Census 2011
White British	8,246	59.51%		White	
White Irish	22	0.16%		White	
Other White Background	172	1.24%	**60.91%**	White	**86%**
White and Black Caribbean	37	0.27%		Mixed/multiple ethnic groups	
White and Asian	48	0.35%		Mixed/multiple ethnic groups	
White and Black African	37	0.27%		Mixed/multiple ethnic groups	
Other mixed background	89	0.64%	**1.52%**	Mixed/multiple ethnic groups	**2.20%**
Indian	971	7.01%		Asian/Asian British	
Pakistani	133	0.96%		Asian/Asian British	
Bangladeshi	46	0.33%		Asian/Asian British	
Chinese	20	0.14%		Asian/Asian British	
Other Asian Background	74	0.53%	**8.98%**	Asian/Asian British	**7.50%**
Black African	82	0.59%		Black/African/Caribbean/Black British	
Black Caribbean	24	0.17%		Black/African/Caribbean/Black British	
Other Black background	38	0.27%	**1.04%**	Black/African/Caribbean/Black British	**3.30%**
Any other ethnic group	90	0.65%	**0.65%**	Arab/Other ethnic group	**1.00%**
Patient declined	2,699	19.48%	**19.48%**		
Unspecified	1,028	7.42%	**7.42%**		
SUMS:	**13,856**	**100.00%**	**100.00%**		**100.00%**

5. Matching need to capacity

In order to determine whether commissioned capacity in primary care only is meeting established need, the contracted UOA activity 94,009 was divided by 22 (assuming 22 UOAs for each case start, i.e. including two assessments to one course of treatment commenced)[30] to provide an estimate of the number of case starts available. To this was added number of cases in the orthodontic care pathway. This was then related to normative need.

Overall availability of UOAs showed that:

- 70% of case starts were available to meet the estimated normative need for treatment in Leicestershire, Lincolnshire and Rutland in primary care alone, however this increases to 100% of case starts were available to meet the estimated normative need adjusted for the child access rates for NHS Dentistry in the area.

Matching commissioned capacity to need can also be determined by dividing the contracted number of UOAs by estimated normative need to give an indication of the number of UOAs available for each case.

- In Primary Care, 13.5 UOAs are available per case of normative need in Leicestershire, Lincolnshire and Rutland's resident 12 year-old resident population however this increases to 19.4 UOAs are available per case of normative need adjusted for the child access rates for NHS Dentistry in the area. This does not take into account the cases commissioned through the orthosntic care pathway.

Other factors affecting supply, demand and uptake of orthodontic services include:

- NHS hospital orthodontic provision
- an unqualified private market
- modifying factors such as, groups with lower perceived need and cases with unstable dental caries considered inappropriate for commencement of orthodontic care

The evidence suggests that there is NHS commissioned availability in primary care providing 70% coverage of total estimated need together with 13.5 UOAs per case of estimated normative need for orthodontic treatment.

6. Deprivation and orthodontic need

The national child dental health survey (2003)[31] examined orthodontic treatment need among 12 to 15-year-olds and found that there was effectively no difference between children from deprived and less deprived areas in terms of need. However, another study analysing data on service use showed that children in less deprived areas were more likely to use orthodontic services compared to children in more deprived areas. The authors suggest that there are many possible reasons for a difference in uptake in areas such as attendance patterns of the child and parent, service provision, personal choice and personal health care priorities but acknowledge that the survey was not detailed enough to provide reasons for possible links between deprivation and orthodontic uptake[32].

In the 2013 Child Dental Health Survey[33], the findings suggest that children from more deprived backgrounds may not be receiving orthodontic treatment compared to children from less deprived areas.

7. Patient flows

The majority of residents in the area receive their treatment in Leicestershire, Lincolnshire and Rutland. Table 16 shows where patients came from for orthodontic treatment to practices in Leicestershie, Lincolnshire and Rutland. Table 17 shows where residents from Leicestershire, Lincolnshire and Rutland went for orthodontic treatment. The tables show that there is a greater number of residents going out of the area for treatment than residents from other areas coming into the area for treatment.

Table 16: Where patients came from for orthodontic dental treatment during the schedule period 201504 to 201603. Contract Health Body: Leicestershire and Lincolnshire

Patient Health Body Name	All Patients	Number of FP17s
Leicestershire and Lincolnshire	12,705	13,413
Unknown	466	483
Derbyshire and Nottinghamshire	284	307
Hertfordshire and the South Midlands	107	119
North Yorkshire and Humber	77	84
East Anglia	62	64
South Yorkshire and Bassetlaw	43	46
Arden, Herefordshire and Worcestershire	24	24
London	4	4
West Yorkshire	2	2
Birmingham and The Black Country	2	2
Shropshire and Staffordshire	2	2
Durham, Darlington and Tees	1	1
Thames Valley	1	1
Bath, Gloucestershire, Swindon and Wiltshire	1	1
	13,781	14,553

Table 17: Where residents attended for orthodontic dental treatment during the schedule period 201504 to 201603. Patient Resident Health Body: Leicestershire and Lincolnshire

Contract AT Name	All Patients	Number of FP17s
Leicestershire and Lincolnshire	12,795	13,413
East Anglia	444	458
Arden, Herefordshire and Worcestershire	378	416
Derbyshire and Nottinghamshire	320	348
Hertfordshire and the South Midlands	211	228
North Yorkshire and Humber	122	126
Shropshire and Staffordshire	35	38
South Yorkshire and Bassetlaw	34	35
Birmingham and The Black Country	6	6
Surrey and Sussex	4	6
South London	3	3
Cheshire, Warrington and Wirral	2	2
West Yorkshire	2	2
Bath, Gloucestershire, Swindon and Wiltshire	1	1
Bristol, North Somerset, Somerset and South Gloucestershire	1	1
Cumbria, Northumberland, Tyne and Wear	1	1
Devon, Cornwall and Isles of Scilly	1	1
Essex	1	1
Greater Manchester	1	1
Kent and Medway	1	1
Lancashire	1	1
North East London	1	1
North West London	1	1
	14,366	15,091

8. Waiting times

In primary care waiting time data for orthodontics is difficult to determine because there is no agreed methodology for assessing waiting times.

A national orthodontic UK survey[34] reported that waiting times for the commencement of treatment was 24 weeks.

Waiting times for assessment and for treatment in primary care range from 0 to 2-3 years, based on data submitted for quarter 4, 2015/16 the average wait time for assessment was 15 weeks and treatment was 25 weeks. There were also 2 orthodontic practices currently operating a closed list and therefore not accepting referrals and 4 mixed contracts not accepting external referrals.

In England, under the NHS Constitution, patients 'have the right to access certain services commissioned by NHS bodies within maximum waiting times, or for the NHS to take all reasonable steps to offer a range of suitable alternative providers if this is not possible'

The maximum waiting time for non-urgent consultant-led treatments is 18 weeks from the day the appointment is booked through the NHS e-Referral Service, or when the hospital or service receives your referral letter.

9. Quality and outcome measures

An orthodontic quality and outcome tool measures quality across a number of indicators; value for money, efficiency, outcomes and patient experience.

Indicators use the UOA value to determine value for money, and a ratio for case assessments to case starts for monitoring efficiency. Although it is important to note that patients maintain the right to seek a specialist opinion by referral despite their IOTN score. Outcomes are measured by peer assessment rating (PAR) scoring cases started and completed., waiting time, which is measured by time to case start and is recommended to be within 18 weeks similar to secondary care. There is an allowance for extra time for treatment planning and pre orthodontic treatment to be completed, such as extractions. The final measure is patient experience

Each indicator contributes 20% to the final score; excellence is defined as a score between 90-100%. To extend a PDS agreement with assurance, practices need to score 90% or above to extend the existing contract for a further 3 years. If the score is above 70% the contract may be extended for a further 2 years year, however, the provider would need to agree to make necessary changes to achieve 90%. Those contracts achieving below 70% but above 50% are given one year and those below 50% a 6-month period in order to improve the quality and value of service provided and reach at least 70% score for a further year extension and 90% for a further 2 years. If these scores are not achieved within the 6-month period, commissioners should consider further procurement dependent on the local needs assessment. NHS England has previously applied the above quality and values outcome audit to enable the extension of PDS agreements in 2013/14.

Patient reported outcome and experience measures (PROMs and PREMs)

The NHS commissioning guide[35] includes details on patient reported outcome measures. These measures are useful indicators for service benchmarking. These data should include centrally collected data via national surveys and data that can be collected locally which should be triangulated. It is also important to consider the respondents, as this should be representative of the patient groups treated.
NHS services are required to implement the ‘friend and family’ test[36]; however this may not be relevant for orthodontic services, due to the nature of the treatment and patient need.

PROMs that may be measured include the pain status for a patient, if they are in pain, whether the patient is able to speak and eat comfortably and if the patient is happy with

the appearance of their teeth. The final suggested outcome measure is relevant for orthodontic services and could be used at the start and end of treatment.

An experience measure that is specific to orthodontics reports on whether the patient was able to book an appointment with their NHS orthodontist at a suitable time for them.

Other patients may value other aspects of the service more than the ability to book an appointment; these include having time to discuss their treatment plan, feeling valued and the communication and attitudes of the dental care professionals at their NHS orthodontist.

To demonstrate learning, providers could show how they have evaluated and responded to feedback.

Peer assessment rating (PAR) scoring

The PAR index is a standardised tool for the objective assessment of orthodontic cases using pre and post treatment study models. A score greater than 70% improvement is a high standard of treatment, less than 50% is a poor standard of treatment and less than 30% shows that a malocclusion has not been improved by treatment. It has been shown that PAR scoring could also be used to measure orthodontic treatment need although it was not designed for this purpose[37].

Data collection

One quality issue is around FP17O forms being submitted with the clinical data set completed. The BSA found that in 2014/2015, 5% of case starts and 14% of completions were submitted without the clinical data set completed and that during 2015/2016, 5.7% of case starts and 12.9% of completions were submitted without the data set completed.

10. Referral management centres

The patient referral system works on market forces and historical choice of provider by the referring dental practitioner. This can lead to acceptance of unnecessary referrals, which may be inappropriate or ill timed, multiple referrals, uneven waiting times and uneven distribution of service availability for patients.

Department of Health and several published papers recommend that central referral management arrangements should be put into place to receive and direct patients to care. These arrangements need to monitor whether referral protocols have been followed.

Appropriate referrals can then be directed to the most appropriate service, whether in primary or secondary care. This will prevent multiple referrals of the same patient and thus multiple assessments.

Where referral management processes are not in place, commissioners should ensure that the numbers of patient assessments per case start are kept under review so that resources are not disproportionately directed to multiple assessments on the same patient.

Referral letters should include details of motivation of the patient to have orthodontic treatment, caries levels and oral hygiene status. In a review of referral letters to one hospital many referrers did not include full details of the medical history, IOTN score, motivation, oral hygiene status and caries status[38].

The former Leicestershire and Lincolnshire area team of NHS England established a pilot referral management system in 2015. All dental practices across our the area submitted all orthodontic referrals (using a standard generic referral form) for NHS orthodontic treatment directly to a Referral Management Centre (RMC) who had been commissioned to support the local team to understand the current demand for NHS orthodontic services in Leicestershire, Lincolnshire & Rutland.

The Dental Referral Management Centre collected the orthodontic referral proforma, recorded the details and sent the proforma on to the orthodontic provider requested by the referring GDP, there was no clinical triage provided.

The pilot RMC ran for over a year (a sufficient timeframe to balance out the highs and lows, and any seasonal variation that may exist) in order to provide a valuable insight into the level of referrals and referral patterns. The information would provide an alternative picture of demand which would benefit the Orthodontic Needs Assessment for the Leicestershire and Lincolnshire area.

For the period 1st April 2015 to 31st March 2016, a total 9,238 referrals were submitted to the RMC. Of these 8,809 were primary care referrals and 429 secondary care; however it should be noted that the actual referrals into secondary care were greater as a number were directly submitted to the hospital orthodontic service.

It was also agreed that the RMC would review the current waiting lists for NHS Orthodontic treatment. Providers were requested to send their lists to the RMC, the information was then validated and patients were contacted to confirm that they wished to remain on the waiting list for the Practice. The exercise also removed any duplicates in the system where a patient may have been referred to more than one provider. The summary position from the validation exercise was that there was a reduction of 36% in the waiting list numbers and approx. 1,800 referrals were removed from the waiting list.

Based on the normative needs calculations, the average normative clinical need (before adjusting for the level of children accessing NHS Dentistry in the area) is 6,956. The volume of referrals was 9,238 (pilot data understated for secondary care), 33% higher than the average normative clinical need.

11. Managed clinical networks

Managed clinical networks (MCNs) should ensure that the highest standard of orthodontic care is provided by the local primary and secondary care workforce and co-ordinating the local provision of orthodontic care in conjunction with commissioners. They would therefore be made up of orthodontists in general and community dental services, the hospital services, referring practitioners, commissioners and the consultants in dental public health. The British Orthodontic Society (BOS) recommends that orthodontic managed clinical networks are established to ensure the efficient and effective provision of orthodontic care in any given geographical area[39].

An orthodontic MCN has been set up across Leicestershire, Lincolnshire and Rutland. MCNs can be instrumental in overseeing agreed care pathways, taking forward discussions and issues relating to referral management, and developing further quality of outcome measures such as PAR scoring.

MCNs will be crucial in the implementation of the new orthodontic commissioning guide. MCNs for orthodontics will allow clinicians to influence the design of services working with patients and commissioners.

12. Conclusions and key considerations

Conclusions

For 2015/16 a total of £8.4m wasis spent on orthodontic care across Leicestershire, Lincolnshire and Rutland. Of this £1.4 million is spent on hospital orthodontic services.

70% of case starts were available to meet the estimated normative need for treatment in Leicestershire, Lincolnshire and Rutland in primary care alone, however this increases to 100% of case starts were available to meet the estimated normative need adjusted for the child access rates for NHS Dentistry in the area. This is an underestimate as it does not include the cases treated in secondary care or those treated privately.

Based on the normative needs calculations, the average normative clinical need (before adjusting for the level of children accessing NHS Dentistry in the area) is 6,956. The volume of referrals was 9,238 (pilot data understated for secondary care), 33% higher than the average normative clinical need. Further work will need to be done to understand the reason for the gap between normative need and demand.

In secondary care in 2015/16, the number of case starts has has been estimated as being between 579 (using all multi-disciplinary tariff), and 835 (using single professional tariff).

The population of Leicestershire, Lincolnshire and Rutland is estimated to grow by 12% by 2026, this will lead to a 12% increase in the estimated normative need for orthodontic treatment. Commissioners need to bear this in mind when making future investment decisions.

Key considerations for NHS England

NHS England Central Midlands may wish to consider:

- further work to understand the reasons for the gap between normative need and demand
- supporting and advising on the collection of detailed analysis of hospital orthodontic services for the area, including a consistent way of reporting orthodontic activity for each trust; This could be done through a CQUIN. This will provide a more accurate data on those undergoing orthodontic treatment in hospitals
- ensure that primary, care pathway and hospital orthodontic contracts provide value for money and quality in outcomes

- undertake a sample audit of referrals for orthodontic treatment sent to the Dental Referral Management Centre
- work with orthodontic practices and Orthodontic MCN to agree a process for validating waiting times and ensuring process of prioritisation of cases based on patient need
- supporting further development of managed clinical networks across Leicestershire, Lincolnshire and Rutland as described in the Orthodntic Commissioning Guide
- ensuring that future commissioning arrangements support equitable access to orthodontic services

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