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Needs Assessment for Orthodontic Services in London

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Contents

About Public Health England	2
Executive summary	5
1. Introduction	7
2. Background and available guidance	8
Delivery of orthodontic activity	8
3. Measuring orthodontic treatment need	9
Review of the literature	9
Methods of assessing orthodontic treatment needs	10
Quantification of orthodontic treatment need	13
Other factors to consider in estimating orthodontic treatment needs	15
4. Understanding orthodontic service provision in London	15
Primary care orthodontic services in London	15
Hospital orthodontic services	17
Assessments and treatments in primary care	20
Patient feedback	23
Stakeholder engagement	24
Funding for primary and secondary care	24
Ethnicity	25
5. Matching need to capacity	25
6. Deprivation and orthodontic need	27
7. Patient flows	27
8. Waiting times	27
9. Quality and outcome measures	28
Patient reported outcome and experience measures (PROMS and PREMS)	28
Peer assessment rating, PAR scoring	29
10. Referral management centres	29
11. Managed clinical networks	30
12. Conclusions	31
13. Next steps	31

14. Acknowledgements.....	32
Appendix A	33
List of figures.....	33
List of maps.....	33
List of tables.....	33
Appendix B: Needs methods by borough level.....	35
Appendix C: Matching need to capacity by borough level.....	38
Appendix D: orthodontic treatment delivery	39
.....	39
References.....	40

Executive summary

This report, which was commissioned by NHS England, provides an assessment of the need for orthodontic services across London. 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 London, normative need for orthodontic treatment was calculated using a variety of methods. The mean of these methods showed that 31,629 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 resident population of London, in a year.

In 2013/14, there were 96 orthodontic primary care contracts open across London of which 70 were limited to orthodontics and 26 mixed. A total of 614,387 units of orthodontic activity (UOA) were contracted across London. The amount of UOAs contracted to mixed contracts in primary care was 56,979.

The value of the primary care orthodontic contracts was £39 million with an additional £22 million spent on hospital orthodontic activity.

Waiting times for assessment and for treatment in primary care was on average 11.3 and 23.3 weeks respectively. However, the range across London was 1 to 104 weeks. Waiting times in secondary care trusts averaged 6.9 weeks for an assessment appointment and 8.1 weeks for the start of treatment.

When capacity was matched to need, 89% of case starts were available in London in primary care alone. Matching capacity to need also showed that 19.5 UOAs were available per case of normative need. Factoring in an unquantified 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 89% NHS coverage and the 19.5 UOAs is appropriate, providing good availability of orthodontic services across London. However, it may be necessary to consider factors in the individual clusters such as patient flows and waiting times. The main patient in and out flows for treatment were between Hertfordshire, Surrey and Sussex. Local access to orthodontic services is unevenly distributed across London.

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

- supporting the further development of managed clinical networks
- working with practices to validate waiting times
- supporting the collection of reliable data for secondary care services
- developing methodology to determine how much orthodontic work is carried out in primary and secondary care.

1. Introduction

The majority of orthodontic services are delivered under time-limited contracts awarded in 2006, which were either personal dental service (PDS) or general dental service (GDS) contracts. Guidance issued by the Department of Health (DH) in 2010 suggested specific considerations to be taken into account by commissioners prior to making decisions on the future of these services. Most primary care trusts (PCTs) extended contracts for up to two years and the agreements ended in 2013. Currently NHS England commissions primary care services including orthodontic services via the area teams (ATs).

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 population need. While the distribution of orthodontic services in London 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.

A pan-London approach is being adopted to reflect the commissioning of dental services by NHS England. Currently contracts have been extended until 2016 by providers able to gain an extension of their contracts of up to three years depending on a number of performance indicators from a quality and value audit.

This report, which was commissioned by NHS England, provides an assessment of the need for orthodontic services across London. 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 London. 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 increased, 2.3% of the total primary care dental budget for England is accounted for by orthodontic related activity.¹ 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 for London.

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 recommended 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 assessment and outcome framework together with compliance required by national regulations. The most recent guidance supports the development of care pathways, the 'pan London' approach and the use of a standard operating procedure. Key policy documents related to orthodontic commissioning are:

- Department of Health (2005) guidance 'Primary dental services: commissioning specialist dental services (revised version)' gateway 5865²
- Department of Health (2006). 'Strategic commissioning of primary care orthodontic services', gateway 7105³
- 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 services⁶ 2013
- Transitional commissioning of primary care orthodontic services⁷ 2012

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 assisted by orthodontic therapists and trainees. Secondary care orthodontists offer advice, training and treat the most complex cases.

3. Measuring orthodontic treatment need

Review of the literature

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

- there may be differences between normative and perceived needs for orthodontic treatment
- there may be discrepancies in professional's opinion of orthodontic need and parents and children's opinion of need^{8,9,10}
- 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 Shaw¹¹ reported that 39% of the 11-12 year population fell into this category
- cases who have a normative/professionally defined need may or may not seek treatment, conversely patients who are not defined as having normative need may still request or have treatment¹²
- to try to factor this into measures for orthodontic treatment need it has been suggested that IOTN should be combined with subjective measures such as the Oral Health Related Quality of life or the Index of Complexity, Outcome and Need (ICON)¹³
- children may be more motivated to seek care if they are teased about the appearance of their teeth¹⁴
- 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 treatment¹⁵
- a low dentist-to-patient ratio can be a predictor for increasing need for orthodontic services, as there is an increased dental awareness^{16,17}
- orthodontic treatment needs are multifactorial and must take into account motivation, attitude, health risks, professional recommendation, costs, duration of treatment and prognosis¹⁸
- failure rate during orthodontic treatment has been reported as 12%-17%, failure is due to patient noncompliance, incorrect diagnosis and incorrect management¹⁸

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 the 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.¹⁹

There are different formulae to assess orthodontic need, a selection of methods are used in this assessment. The methods used include methods used in the original London orthodontic needs assessment and methods used in other needs assessments, they are credited in the **Acknowledgements**:

- Child Dental Health survey method
- Stephen's method
- 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 current providers and the services they deliver 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 the 2003 National Child Dental Health survey

The National Child Dental Health survey (CDH) 2003 showed 35% of 12 year-old children in the UK had an IOTN score of 3.8 or above, this was based on dental health grounds and aesthetic grounds - a combination or individually.²⁰

Regarding parental views, 42% of parents of 12-year-olds with a clinically judged malocclusion felt their children's teeth needed straightening on dental health grounds. Fifty-two percent of parents of 12-year-olds felt that their child required orthodontic treatment for aesthetic reasons.²¹

The table below summarises the application of the CDH formula to estimate normative need for orthodontic treatment in London.

Table 1: Assessment of need for orthodontic treatment using the assessment from the Child Dental Health survey (2003)

Child Dental Health survey method	(a) 12-year-old population	(b) Normative need 35% of (a)
North East AT	36,788	12,876
North West AT	20,761	7,266
South AT	33,090	11,582
London	90,639	31,724

(Based on methodology from Wiltshire's orthodontic report – see Acknowledgements)

For borough-level data please see Appendix.

Estimating orthodontic need using Stephen's formula

Stephen's formula involves assessing need from the Dental Health Component (DHC) categories 4 and 5 of the IOTN²². It is considered that only a proportion of patients in DHC 3 justify treatment, and in Stephen's method, it is considered that this category is largely offset by the proportion of cases in category 4 and 5 who, despite a normative need for orthodontic treatment, decline care. Stephen's formula has additional factors for those who require interceptive treatment (9%) and for adult treatment (4%). The formula is based on the assumption that approximately one third of the 12-year-old population will require orthodontic treatment, and that this third will be in categories 4 and 5 of the IOTN scale. For those in category 3 who do require treatment they are accounted for as a number of people in 4 and 5 may decline treatment, this is the first part of the formula. The second part of the formula includes calculations for additional factors; this includes early or interceptive orthodontic treatment and late or adult orthodontic treatment.

This is expressed as:

$$\frac{\text{12-year-old population}}{3} \times \frac{100 + \text{Interceptive factor} + \text{Adult factor}}{100}$$

(Where Interceptive factor = 9, Adult factor = 4)

The latest population estimates from the Office for National Statistics (ONS)²³ for 12-year olds is 90,369. Using the most recent available ONS estimates of the 12-year-old population in London, need for orthodontic treatment was estimated using Stephen's formula. This showed that 34,141 cases of orthodontic treatment are required to be

commissioned to meet the estimated normative needs for the resident population of London in a year.

The table below summarises the application of the Stephen's method per area team and for London.

Table 2: Normative (clinical) need using Stephen's predictive formula and estimated perceived need

Stephen's formula	(a)12-year-old population ONS 2013 estimate	(b)Normative need (a) /3	(c)Normative need adjusted for interceptive and adult factor (b) x 100+9+4/100
North East AT	36,788	12,263	13,857
North West AT	20,761	6,920	7,820
South AT	33,090	11,030	12,464
London	90,639	30,213	34,141

(Source ONS mid-2013 estimated resident population, published June 2014, accessed November 2014)

For borough level, data please see appendix.

Estimating orthodontic need using the Holmes method

Holmes²⁴ studied 955 12-year-olds, and estimated that 36.3% of 11 to 12-year-old children had an IOTN of 3 or higher and an aesthetic component (AC) 6 or higher. He assessed the subjective need and demand for orthodontic treatment and found that even those with a lower aesthetic component grading were willing to accept orthodontic treatment. This method shows the estimated normative need of 32,902.

Table 3: Normative (clinical) need using the Holmes predictive formula

Holmes method	(a)12-year-old population ONS 2013 estimate	(b)Normative need 36.3% of (a)
North East AT	36,788	13,354
North West AT	20,761	7,536
South AT	33,090	12,012
London	90,639	32,902

For borough-level data please see appendix.

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

The 2008/09 dental survey of 12-year-olds²⁵ included an orthodontic component, assessing the amount of children examined wearing an appliance, the demand and need. In London 11 PCT areas did not take part in the survey therefore calculations at AT and borough level are not available. Normative need is estimated at 27,748.

Table 4: Normative (clinically defined) orthodontic need in London using the NHS 12-year-old Dental Health survey

NHS DEP Method	12-year-old pop data ONS latest	(c)% of children examined wearing an appliance	(d) Estimated numbers not already wearing an appliance (a) – (c)x(a)	(e) Normative need in those not wearing an appliance % DHC =1 or AC 8-10	(f) Estimated numbers of children with orthodontic need and not wearing a brace (e) x (d)
London	90,639	9.9%	81,611	34.0%	27,748

(Source: NHS Dental Epidemiological Survey of 12-year-olds children 2008/09 and ONS population estimates for UK, England and Wales, Scotland and Northern Ireland, Mid-2013)

(Based on methodology from Wiltshire's orthodontic report – see Acknowledgements)

Quantification of orthodontic treatment need

Table 5 summarises the different needs calculations for the different methods, and the mean of these methods for London. The mean estimate of normative need for London is 31,629.

Table 5: Summary of methods of assessing normative and perceived need and mean for London

Summary of normative need calculations and mean for London	
Method of calculation	Normative (clinical need)
NHS 12-year-old survey 2008/09	27,748
Stephen's predictive method	34,141
Holmes predictive method	32,902
National Child survey 2003 (DH method)	31,724
Average	31,629

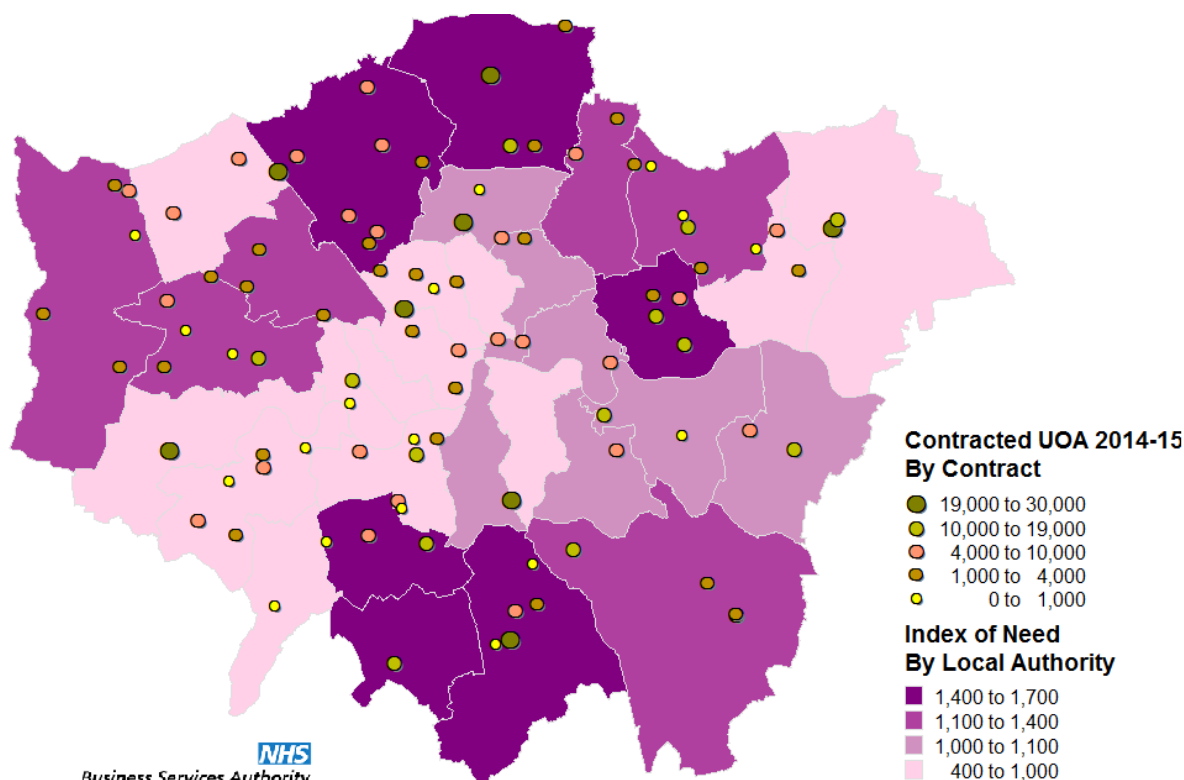
Table 6 identifies the London boroughs with the highest and lowest levels of orthodontic treatment need.

Table 6: Boroughs with the highest and lowest treatment need (based on calculations available at borough level)

Highest need	Lowest need
<i>Based on borough level need data</i>	
Croydon	Kensington and Chelsea
Merton	Hammersmith and Fulham
Sutton	Kingston upon Thames
Barnet	Islington
Enfield	Westminster
Newham	Richmond upon Thames
Ealing	Camden
Redbridge	Wandsworth
Bromley	Barking and Dagenham
Brent	Harrow

Map 1 shows the location of orthodontic practices across London, the size of the marker denotes the size of the contract. The map also shows the need at borough level, the darker the colour the greater the orthodontic need in that area. The contracts shown are NHS contracts; this map does not include private orthodontic contracts.

Map 1: Treatment need for London boroughs overlaid with treatment locations and size of UOA contract (Source NHSBSA)



Population growth

By 2017, the London population of 12-year olds is set to grow from 90,639¹ to 94,200², a 3.78% rise. This suggests that need may increase by an estimated 4%.

Other factors to consider in estimating orthodontic treatment needs

Orthodontic services are mainly provided on a referral basis from General Dental Practitioners after assessment. In 2011/12, an estimated 78% of 12-year-old children resident in London visited an NHS dentist with a wide variation between areas of London ranging between 54% and 98% at PCT level³.

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. In London, an average of 28% of 12-year olds have active and untreated tooth decay.²⁶

4. Understanding orthodontic service provision in London

Primary care orthodontic services in London

In London, there are 96 NHS primary care orthodontic contracts open. Twenty-six are General Dental Services (GDS) mixed orthodontics contracts and 70 contracts are limited to orthodontics. Primary care orthodontic contracts (including the orthodontic component of mixed contracts) totalled a spend of £39 million, which amounted to 2.29% of spend on all primary dental care. Data on the orthodontic component of mixed contracts showed that the total contract value was £4.3 million.

There were a total of 614,387 UOA contracted across the London in 2014 in the primary care sector. This included orthodontic service provision in the salaried dental services.

¹ <http://www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk--england-and-wales--scotland-and-northern-ireland/2013/index.html>

² <http://data.london.gov.uk/dataset/gla-population-projections-custom-age-tables>

³ Source NHS Dental Services

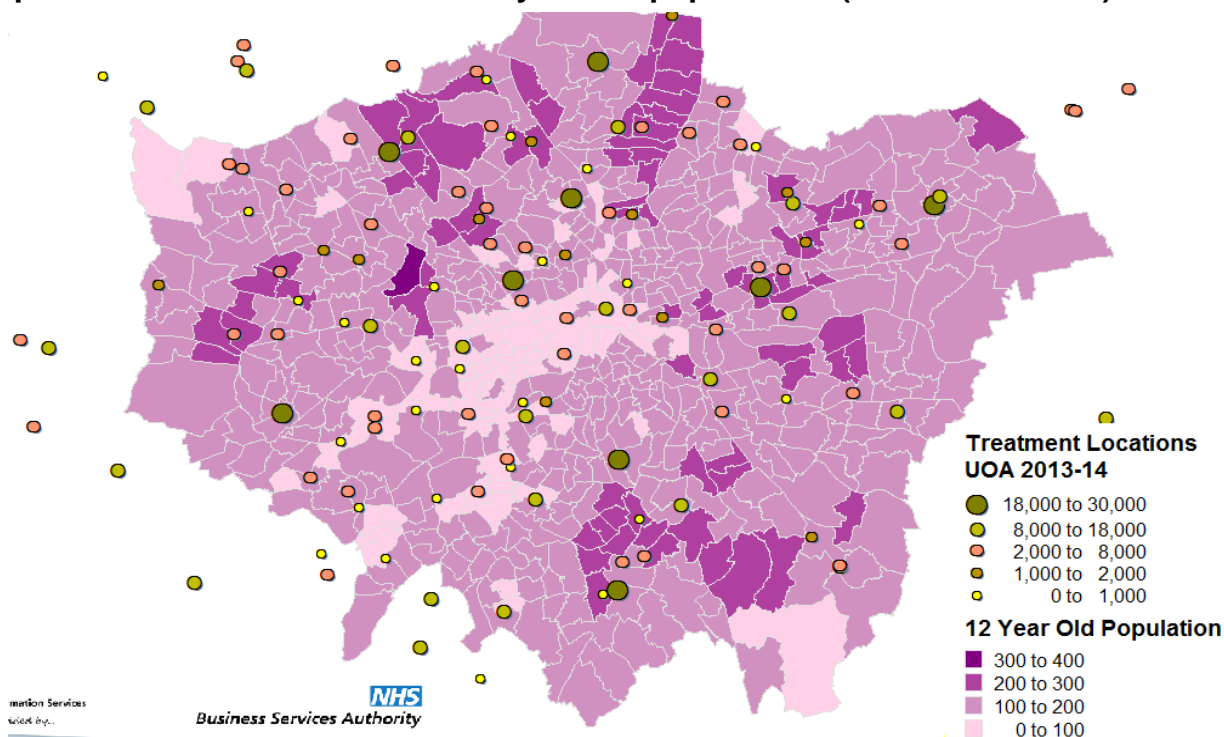
Overall 96% of contracted activity was delivered in 2013/14 although the South and North West areas delivered 99% (table 7).

Table 7: UOAs contracted and UOAs delivered in primary care 2013/14

UOAs contracted and UOAs delivered 2013/14 primary care				
	South London Area Team	North East London Area Team	North West London Area Team	Total
UOAs contracted across each London borough	211,076	270,878	132,433	614,387
Contracted activity was delivered in the past year	209,054	251,192	131,316	591,562
% delivered	99%	93%	99%	96%

Map 2 shows the treatment locations and the size of the contracts. The shading represents the population of 12-year-olds at ward level. Wards with higher populations of 12-year-olds may have more treatment need, as this population group is at the age most likely to start orthodontic treatment.

Map 2: Treatment Locations and 12-year-old populations (Source NHSBSA)



Hospital orthodontic services

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 13 hospital trust providers of orthodontics in London:

- Barking, Havering and Redbridge Hospitals NHS Trust
- Barnet and Chase Farm Hospitals NHS Trust
- Barts Health NHS Trust (*includes Whipps Cross University Hospital NHS Trust*)
- Chelsea and Westminster Hospital NHS Trust
- Croydon Health Services NHS Trust
- Epsom and St Helier University Hospitals NHS Trust
- Guy's and St Thomas' NHS Foundation Trust
- King's College Hospital NHS Foundation Trust (*includes South London Hospital Trust*)
- Kingston Hospital NHS Trust
- North West London Hospitals NHS Trust
- St George's Healthcare NHS Trust
- The Hillingdon Hospitals NHS Foundation Trust
- University College London Hospitals NHS Foundation Trust

Whipps Cross has merged with Barts Health NHS Trust and South London Hospitals Trust has merged with King's. Chelsea and Westminster is merging with West Middlesex, and North West London is merging with Ealing Hospitals Trust in 2015.

A number of London residents are treated in acute trusts outside of London such as Ashford and St Peter's Hospital and the Royal Surrey Hospital. Most referrals to the hospital services are now through a referral pathway with referrals accepted from GPs, Salaried Dental Services and from specialists for more complex care. In addition to providing orthodontic care for patients who have IOTN > 3.6, 4 and 5 the following complex orthodontic services are provided in joint discipline clinics:

- treatment and counselling for neo-natal cleft lip and palate babies
- correction of occlusal dysfunction in children
- jaw growth modification by appliances
- correction of severe tooth misalignment
- adult treatment for severe malocclusion with functional or psychological problems
- joint treatment with other consultants

Training of orthodontic specialists is an important function presently carried out in these trusts. There are 58 orthodontic training posts in the London area²⁷ (December 2013).

Primary care dentistry, including orthodontic specialist services, is commissioned for patients choosing to attend a practice in that area and commissioning recognises the inflow of non-residents. However, 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)²⁸ tariff.

Outpatient activity provided by London hospital trust orthodontic services

Aggregated orthodontic outpatient activity is presented below for London providers treating London residents, non-London residents and for where the residency is unknown.

In 2014 there were some out-flows of London resident orthodontic patients who were treated by trusts outside of London. However, 95% of all London residents' outpatient attendances were provided by a trust situated in London.

Table 8 shows the year projections for secondary care provider activity. Due to differences in coding, data from four providers are not included. Ninety nine percent (99%) of orthodontic activity in London hospital trusts is provided to London residents, based on the April to September Secondary Users Service (SUS) data.

Table 8: Provider activity for London residents in all trusts 2014

Provider activity for London residents					
Provider Name	Age group	Region	First attendance	Follow up activity	Total (per year)
Total	Adults	London	2,044	25,168	27,212
Total	Children (<18 years)	London	8,022	75,080	83,102
Total London only			10,066	100,248	110,314
Total	Adults	Non London and unknown	112	924	1,036
Total	Children (<18 years)	Non London and unknown	236	870	1,106
Total any provider trust			10,414	102,042	112,456

Table 9 shows that the majority of orthodontic treatment in secondary care is provided to children (75%).

Table 9: Proportion of children and adult outpatient orthodontic activity provided for London residents at London trusts Apr 14-Sep14

Outpatient activity	First attendance	Follow up activity	Total activity
Adults	20%	25%	25%
Children	80%	75%	75%

Payment by Results²⁹ (PbR) 2014/15 national tariff basic pricing for outpatient attendances for orthodontics speciality code 143 are shown in Table 10.

Table 10: PbR tariff 2014/15

Treatment function	Treatment function name	Consultant led (£)			
		WF01B <i>First attendance - single professional</i>	WF02B <i>First attendance - multi professional</i>	WF01A <i>Follow up attendance - single professional</i>	WF02A <i>Follow up attendance - multi professional</i>
143	Orthodontics	180	247	80	113

Most cases will be single professional cases as only limited complex multidisciplinary cases will be eligible for a multi professional fee.

Table 11 shows the estimated annual spend for orthodontics in secondary care in London at £20 million. However, as this is year to date activity the projected annual spend estimated by NHS England for 2014/15 is estimated as £22 million.

Table 11: Year to date (YTD) orthodontic activity actual costs 2014 for London trusts

Trust (including all trusts)	Sum of YTD actual cost £000s
Barking, Havering and Redbridge University Hospitals NHS Trust	272
Barnet and Chase Farm Hospitals NHS Trust	321
Barts Health NHS Trust	1,374
Chelsea and Westminster Hospital NHS Foundation Trust	269
Croydon Health Services NHS Trust	305
Epsom and St Helier University Hospitals NHS Trust	72
Guy's and St Thomas' NHS Foundation Trust	1,137
King's College Hospital NHS Foundation Trust	1,846
Kingston Hospital NHS Trust	319
North West London Hospitals NHS Trust	509
St George's Healthcare NHS Trust	459
The Hillingdon Hospitals NHS Foundation Trust	121
University College London Hospitals NHS Foundation Trust	1,451
Grand total	8,454
12 month total estimate	20,290

Assessments and treatments in primary care

Figure 1 demonstrates the proportion of assessments with the subsequent decision to start treatment. A high number of assess to fit is an indicator of efficiency as it shows that a greater number of assessments are being treated. 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 patients' residence. The patient's residence is determined by the postcode recorded in the personal details section of each FP17 submitted. Data has been extracted for the 12 months up to March 2014.

Figure 1: Percentage of assessments that were ‘assess and fit appliance’ (12 months to March 2014) (Source NHSBSA)

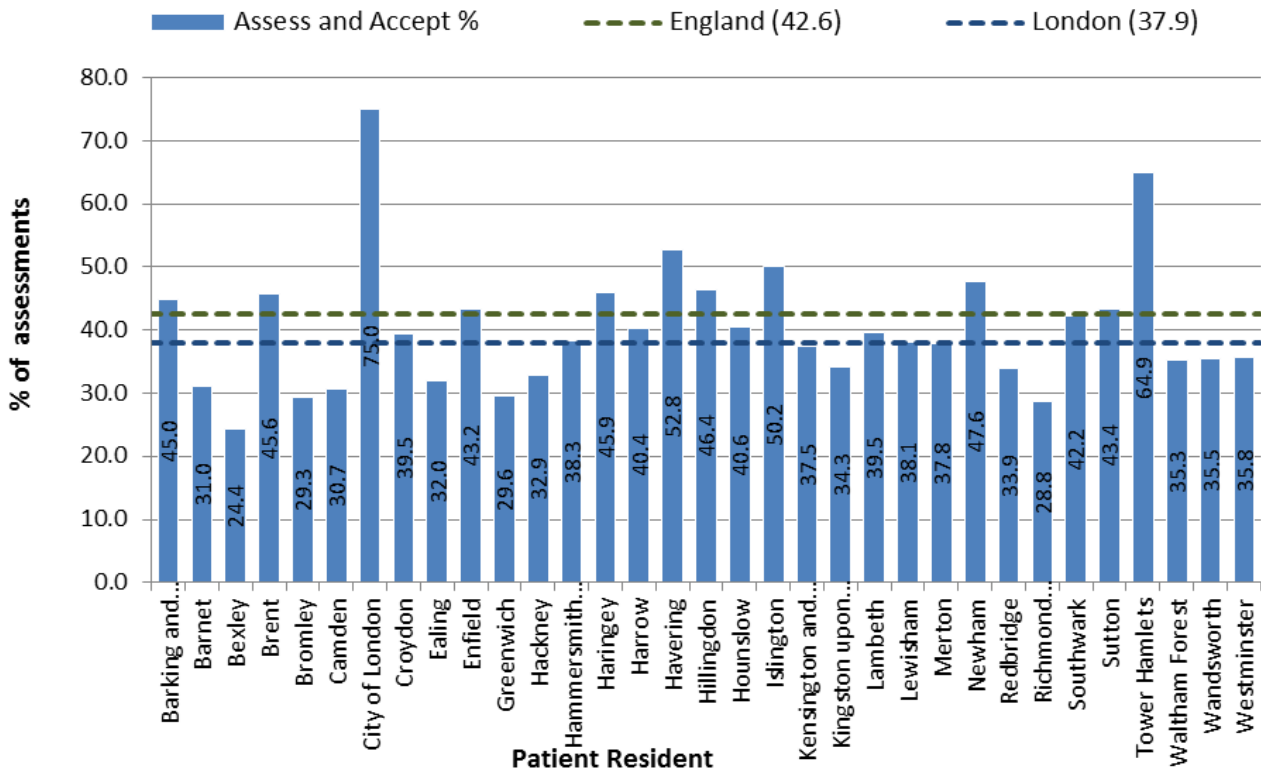
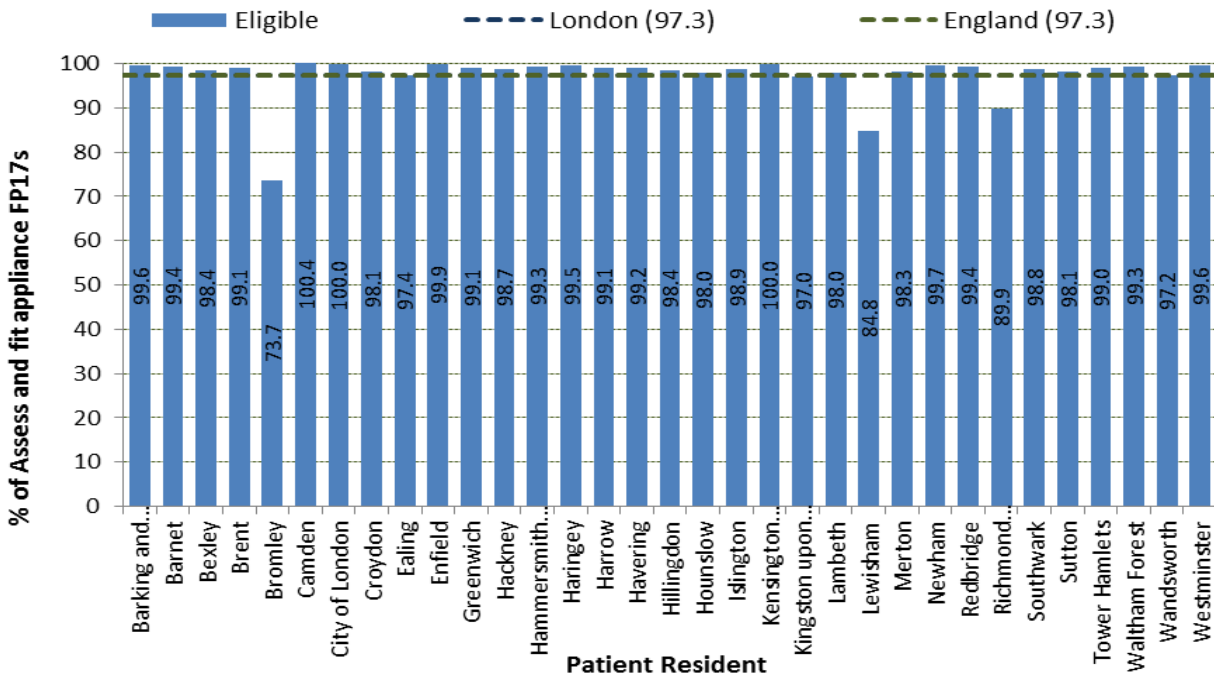


Figure 2 is an indicator of the eligibility of cases accepted for treatment using the IOTN assessment. A low percentage indicates that not all of the cases accepted were eligible for treatment by using the IOTN method of assessing need.

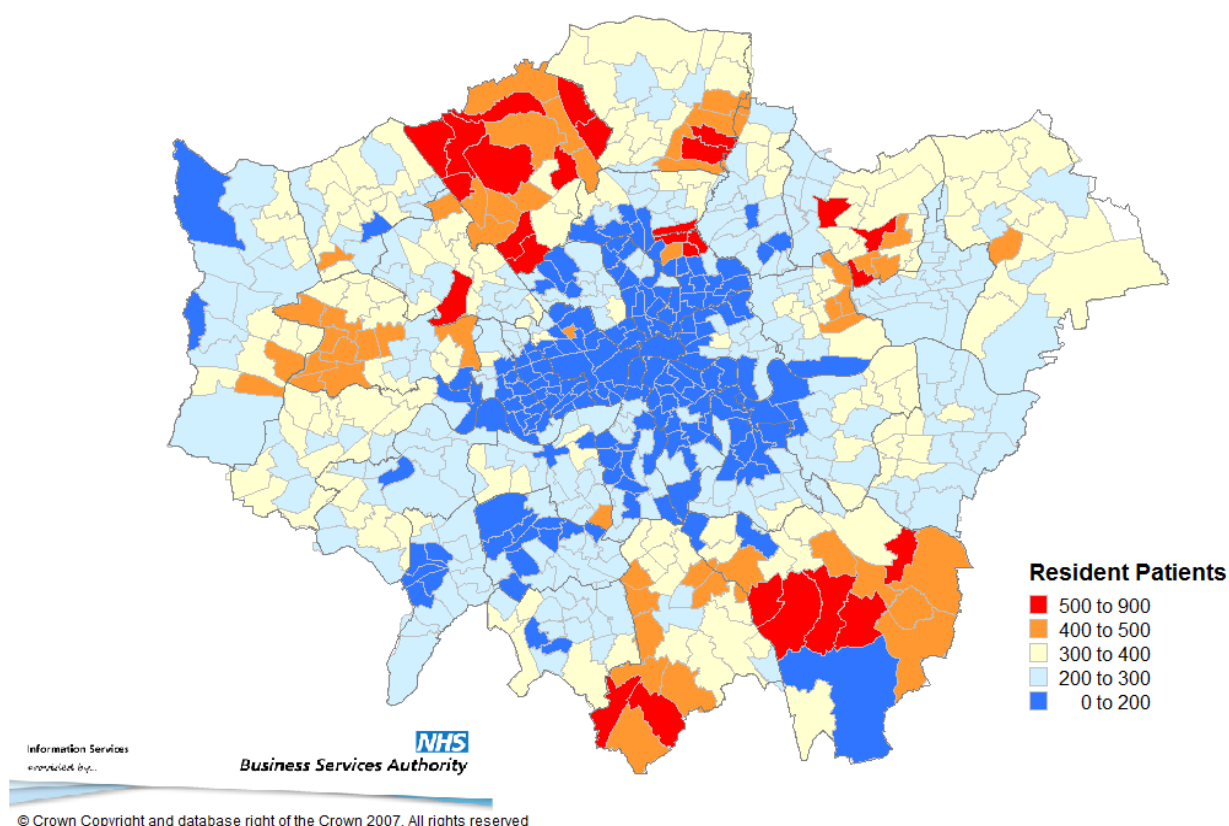
Figure 2: Percentage of assess and fit appliance FP17s where the IOTN was eligible (Source NHSBSA)



Resident population attending a dentist (primary care orthodontic services)

Map 3 demonstrates the number of patients visiting an NHS orthodontist, the red and orange areas are an indicator of more patients accessing services therefore greater demand. The map shows that the highest areas of demand are Barnet, Bromley and Croydon, with additional pockets of high demand in Enfield, Hillingdon, Ealing, Redbridge and Brent.

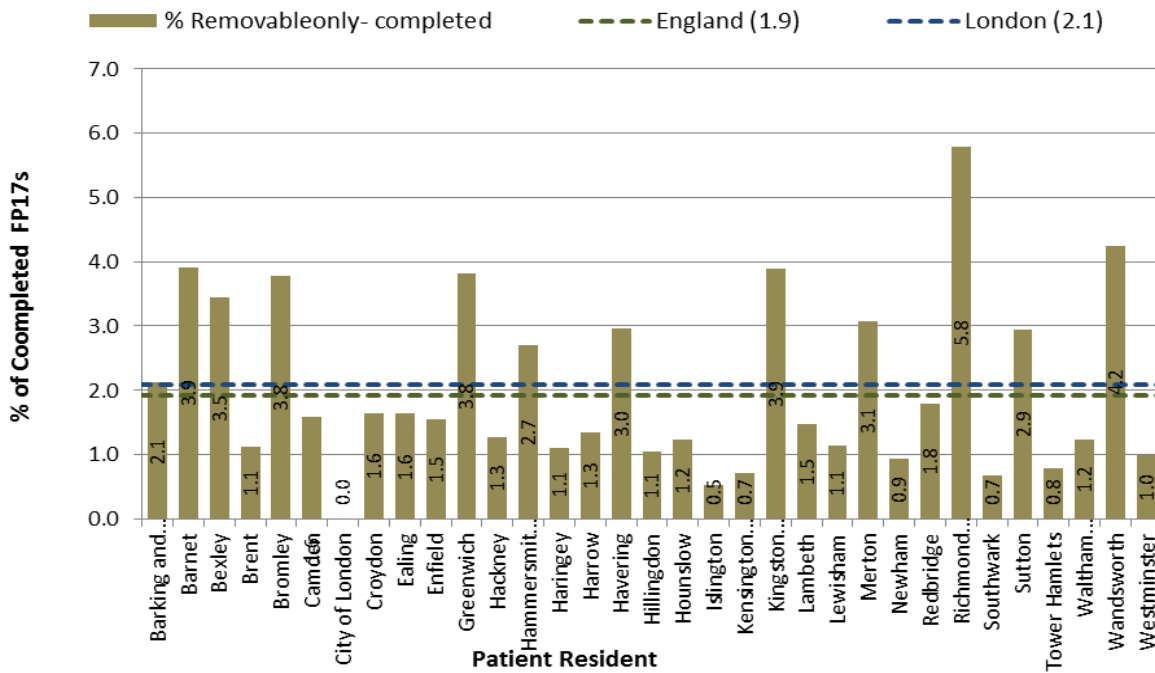
Map 3: Total resident patients attending NHS orthodontist (24 months to March 2014) (Source NHSBSA)



Treatment

Figure 3 demonstrates the amount of courses of treatment carried out with removable appliances only. In the majority of cases, fixed appliances provide more favourable outcomes.

Figure 3: Percentage completed treatment with removable appliances only (Source NHSBSA)



Patient feedback

The NHS Dental Services send a questionnaire to random sample of patients who have received orthodontic care. A total of 7,612 questionnaires were sent to patients treated in London between April 2012 and March 2014.

The majority of respondents (93.4%) received NHS treatment; a small proportion (6.1%) 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 the majority of patients (96%) were completely or fairly satisfied with their orthodontic treatment (Table 12).

Table 12: 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

As part of the pan London orthodontic project 2011/12, stakeholders were consulted. This included orthodontic providers from primary and secondary care, referring practitioners and patients. The key findings are summarised below, the full report is referenced ¹⁹:

- high satisfaction rates from all stakeholders with respect to treatment outcomes and quality of care
- patients satisfied with waiting time for assessment and treatment but specialists complained of long waiting lists
- IOTN eligibility and under age were the most common reasons for refusal of referrals
- providers agreed on the need for managed clinical networks and robust audit processes to ensure that referral criteria and care pathways were adhered to
- key factors to be considered in awarding new contracts were patient experience, local needs and performance
- providers reported that a longer contract would provide greater stability and would improve services
- specialists were concerned about having to go through a tendering process
- a need for an orthodontic advisor for London

Funding for primary and secondary care

The total spend on primary and secondary care orthodontics in London for 2014/15 was £61 million.

Primary care orthodontic contracts (including the orthodontic component of mixed contracts) totalled £39 million which amounted to 2.3% of spend on all primary dental care in England. Data on the orthodontic component of mixed contracts showed that the total contract value was £4.3 million.

The estimated annual spend for orthodontics in secondary care is estimated as £22 million.

The figures above show that 63% of spend is on secondary care and 37% on primary care orthodontics. Interestingly only 15% of orthodontic treatment is delivered by secondary care.

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 London 84.2% of claims had ethnicity data recorded in 2013/14.

The ethnic profile of people receiving NHS primary care orthodontic services in London broadly matches the ethnic profile of the London population (Table 13).

Table 13: Comparison of ethnicity of orthodontic patients and ethnic profile of the population of London

Ethnicity	% Ethnic profile of orthodontic patients	% Census 2011
White all groups	53	60
Black all groups	13	13
Asian all groups	21	18
Mixed/multiple ethnicities	7	5
Other	6	3

5. Matching need to capacity

In order to determine whether commissioned capacity in primary care only is meeting estimated need, the contracted UOA activity (614,387) was divided by 22 (assuming 22 UOAs for each case start, ie including two assessments to one course of treatment commenced)³⁰ to provide an estimate of the number of case starts available. This was then related to normative need.

Overall availability of UOAs showed that:

- **89%** of case starts were available to meet the estimated normative need for treatment of London’s resident population in **primary care alone**

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

- in primary care, **19.5 UOAs** are available per case of normative need in London’s resident population

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

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

Need and capacity at NHS England area team level

Table 14 gives an estimate of need at AT level using three methods of assessing orthodontic treatment need (Holmes, Stephen's and Child Dental Health survey methods). The figures show that there were 92% available case starts for the North East Area Team and 80% for the South and North West Area Team. The table also shows that there are 20.3 UOAs available for case starts for the North East, and 17.6 for the North West and South London ATs.

Table 14: Estimated need matched to available UOA at London Area Team

(A) Area	(B) mean need (three methods)	(C) contracted UOA	(D) estimated case starts available (C/22)	(E) % case starts available to normative need (%D/B)	(F) UOA/normative need (C/B)
North East AT	13,362	270,878	12,313	92%	20.3
North West AT	7,541	132,433	6,020	80%	17.6
South AT	12,019	211,076	9,594	80%	17.6
London	31,629	614,387	27,927	89%	19.5

The evidence suggests that there is NHS commissioned availability in primary care providing 89% coverage of total estimated need together with 19.5 UOAs per case of estimated normative need for orthodontic treatment.

Based on factors listed above, the commissioned availability should meet the current expressed needs of the resident London population.

6. Deprivation and orthodontic need

The national Child Dental Health survey (2003)³¹ examined orthodontic treatment needs 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 uptake³².

In the 2013 Child Dental Health survey³³, 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 London residents (96%) receive their treatment in London. Other areas where London residents received their treatment were, Surrey, Sussex, Hertfordshire, Essex and Kent and Medway. Almost 94% of London residents had their orthodontic treatment within their Area Team of residence.

8. Waiting times

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

A national orthodontic UK survey³⁴ reported that waiting times for the commencement of treatment was 24 weeks.

A survey of waiting times in primary care orthodontic services carried out in London in 2011/12 found that waiting times for an assessment was on average 11.3 weeks and for start of treatment 23.2 weeks. Waiting times for both assessment and treatment ranged from 1 to 104 weeks. Larger practices (>5,000 UOA contract) had more patients waiting for assessment than smaller practices.

A survey of London trusts carried out in 2014 found that waiting times in secondary care for an assessment appointment by a consultant led team was on average 6.9 weeks (range 1-15 weeks) and to commence treatment an average of 8.1 weeks (range 2 to 15 weeks). However, a survey of orthodontic consultants reported waiting times for a new patient assessment to be on average a wait of 18 weeks, the range was 0-25 months.³⁵

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. The final measure is patient experience, 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.

Each indicator contributes 20% to the final score; excellence is defined as a score between 90-100%. Depending on the annually appraised results a score of 90% and above can result in a three-year contract extension, a score above 70% allows a two-year contract extension with measures in place to increase this to 90%. Contracts achieving between 50-70% are entitled to a year's contract extension. For contracts returning scores of below 50% a contract for six-month timescale is issued, during this time the quality and value should be improved. A further year can be awarded if 70% is subsequently achieved and a further two years if 90% is achieved.

Patient reported outcome and experience measures (PROMS and PREMS)

The NHS England draft commissioning guide³⁶ 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 'Friends and family' test³⁷, however, this may not be as 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. The tool is designed for groups of cases rather than an assessment of individual improvement. A score of greater than 70% improvement is a high standard of treatment, less than 50% is a poor standard and less than 30% shows that the 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.³⁸

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.

DH 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.³⁹

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.⁴⁰

Not all parts of London presently have available an orthodontic MCN. MCNs can be instrumental in overseeing agreed care pathways, taking forward discussions and issues relating to referral management, and developing further quality of outcomes 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

A total of £61 million is spent on orthodontic care in London. Of this 36% (£22 million) is spent in hospital orthodontic services.

Estimated need matched to capacity for primary care shows that there is 89% of case starts matched to need across London. There are 19.5 UOAs available for each case start.

Factoring an un-quantified private market, cases with unstable dental caries and hospital orthodontic service provision the data from this needs assessment suggests that the overall orthodontic activity contracted for London residents' meets normative need. There is however some variation across clusters.

13. Next steps

NHS England may wish to consider the following:

- supporting the further development of managed clinical networks across London
- working with orthodontic practices and MCNs to agree a process for validating waiting lists/times and ensuring the process of prioritisation of cases based on patient need
- supporting and advising on the collection of detailed analysis of hospital orthodontic services for NHS England, including a consistent way of reporting orthodontic activity for each trust
- ensuring that hospital orthodontic contracts provide value for money and quality in outcomes
- ensuring that future commissioning arrangements support equitable access to orthodontic services

14. Acknowledgements

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Published needs assessments were reviewed to update this London needs assessment including:

- The need for orthodontic treatment in Wiltshire – an update, 2012
- Orthodontic needs assessment Dr J S Sandham, dental public health team, Public Health Wales 16 August 2013
- Orthodontic assessment of 12-year-olds in Yorkshire and the Humber November 2008/09
- A review of orthodontic need and the provision of orthodontic services across Greater Manchester 2013, Michael McGrady, Colette Bridgman

Appendix A

List of figures

Figure 1: Percentage of assessments that were ‘assess and fit appliance’ (12 months to March 2014) (Source NHSBSA)	21
Figure 2: Percentage of assess and fit appliance FP17s where the IOTN was eligible (Source NHSBSA)	21
Figure 3: Percentage completed treatment with removable appliances only (Source NHSBSA)	23
Figure 4 orthodontic treatment delivery	39

List of maps

Map 1: Treatment need for London boroughs overlaid with treatment locations and size of UOA contract (Source NHSBSA).....	14
Map 2: Treatment Locations and 12-year-old populations (Source NHSBSA).....	16
Map 3: Total resident patients attending NHS orthodontist (24 months to March 2014) (Source NHSBSA).....	22

List of tables

Table 1: Assessment of need for orthodontic treatment using the assessment from the Child Dental Health survey (2003)	11
Table 2: Normative (clinical) need using Stephen’s predictive formula and estimated perceived need.....	12
Table 3: Normative (clinical) need using the Holmes predictive formula.....	12
Table 4: Normative (clinically defined) orthodontic need in London using the NHS 12-year-old Dental Health survey.....	13
Table 5: Summary of methods of assessing normative and perceived need and mean for London.....	13
Table 6: Boroughs with the highest and lowest treatment need (based on calculations available at borough level)	14
Table 7: UOAs contracted and UOAs delivered in primary care 2013/14	16
Table 8: Provider activity for London residents in all trusts 2014	18
Table 9: Proportion of children and adult outpatient orthodontic activity provided for London residents at London trusts Apr 14-Sep14.....	19
Table 10: PbR tariff 2014/15	19
Table 11: Year to date (YTD) orthodontic activity actual costs 2014 for London trusts	20
Table 12: Patients satisfaction with dental treatment (Source NHSBSA).....	23
Table 13: Comparison of ethnicity of orthodontic patients and ethnic profile of the population of London.....	25
Table 14: Estimated need matched to available UOA at London Area Team (AT)	26

Table 15 CHDS (DH) method of calculating need borough level	35
Table 16 Stephen's predictive method of assessing need at London borough level	36
Table 17 Holmes method of assessing need by borough level	37
Table 18 Needs compared to contracted activity per borough	38

Appendix B: Needs methods by borough level

Needs methods by borough level

Table 15 CHDS (DH) method of calculating need borough level

Child Dental Health survey method	(a)12-year-old population	(b)Normative need 35% of(a)
Havering	2,741	959
Barking and Dagenham	2,686	940
Redbridge	3,667	1,283
Newham	3,873	1,356
Waltham Forest	3,037	1,063
Tower Hamlets	2,809	983
City and Hackney	2,830	991
Islington	1,831	641
Haringey	3,003	1,051
Enfield	4,030	1,411
Barnet	4,123	1,443
Camden	2,158	755
North East Area Team	36,788	12,876
Harrow	2,694	943
Brent Teaching	3,561	1,246
Hammersmith and Fulham	1,563	547
Kensington and Chelsea	1,356	475
Westminster	1,848	647
Ealing	3,822	1,338
Hillingdon	3,216	1,126
Hounslow	2,701	945
North West Area Team	20,761	7,266
Bexley	2,894	1,013
Bromley	3,623	1,268
Croydon	4,416	1,546
Greenwich Teaching	2,886	1,010
Kingston	1,688	591
Lambeth	2,950	1,033
Lewisham	2,953	1,034
Richmond and Twickenham	1,975	691
Southwark	2,747	961
Sutton and Merton	4,405	1,542
Wandsworth	2,553	894
South Area Team	33,090	11,582

Table 16 Stephen's predictive method of assessing need at London borough level

Stephen's predictive formula	(a)12-year-old population ONS 2013 estimate	Normative need (a) /3	Normative need adjusted for interceptive and adult factor (b) x 100+9+4/100
Havering	2,741	914	1,032
Barking and Dagenham	2,686	895	1,012
Redbridge	3,667	1,222	1,381
Newham	3,873	1,291	1,459
Waltham Forest	3,037	1,012	1,144
Tower Hamlets	2,809	936	1,058
City and Hackney	2,830	943	1,066
Islington	1,831	610	690
Haringey	3,003	1,001	1,131
Enfield	4,030	1,343	1,518
Barnet	4,123	1,374	1,553
Camden	2,158	719	813
North East Area Team	36,788		13,857
Harrow	2,694	898	1,015
Brent Teaching	3,561	1,187	1,341
Hammersmith and Fulham	1,563	521	589
Kensington and Chelsea	1,356	452	511
Westminster	1,848	616	696
Ealing	3,822	1,274	1,440
Hillingdon	3,216	1,072	1,211
Hounslow	2,701	900	1,017
North West Area Team	20,761		7,820
Bexley	2,894	965	1,090
Bromley	3,623	1,208	1,365
Croydon	4,416	1,472	1,663
Greenwich Teaching	2,886	962	1,087
Kingston	1,688	563	636
Lambeth	2,950	983	1,111
Lewisham	2,953	984	1,112
Richmond and Twickenham	1,975	658	744
Southwark	2,747	916	1,035
Sutton and Merton	4,405	1,468	1,659
Wandsworth	2,553	851	962
South Area Team	33,090		12,464

Table 17 Holmes method of assessing need by borough level

Holmes method	(a)12-year-old population ONS 2013 estimate	(b)Normative need 36.3% of (a)
Havering	2,741	995
Barking and Dagenham	2,686	975
Redbridge	3,667	1,331
Newham	3,873	1,406
Waltham Forest	3,037	1,102
Tower Hamlets	2,809	1,020
City and Hackney	2,830	1,027
Islington	1,831	665
Haringey	3,003	1,090
Enfield	4,030	1,463
Barnet	4,123	1,497
Camden	2,158	783
North East Area Team	36,788	13,354
Harrow	2,694	978
Brent Teaching	3,561	1,293
Hammersmith and Fulham	1,563	567
Kensington and Chelsea	1,356	492
Westminster	1,848	671
Ealing	3,822	1,387
Hillingdon	3,216	1,167
Hounslow	2,701	980
North West Area Team	20,761	7,536
Bexley	2,894	1,051
Bromley	3,623	1,315
Croydon	4,416	1,603
Greenwich Teaching	2,886	1,048
Kingston	1,688	613
Lambeth	2,950	1,071
Lewisham	2,953	1,072
Richmond and Twickenham	1,975	717
Southwark	2,747	997
Sutton and Merton	4,405	1,599
Wandsworth	2,553	927
South Area Team	33,090	12,012

Appendix C: Matching need to capacity by borough level

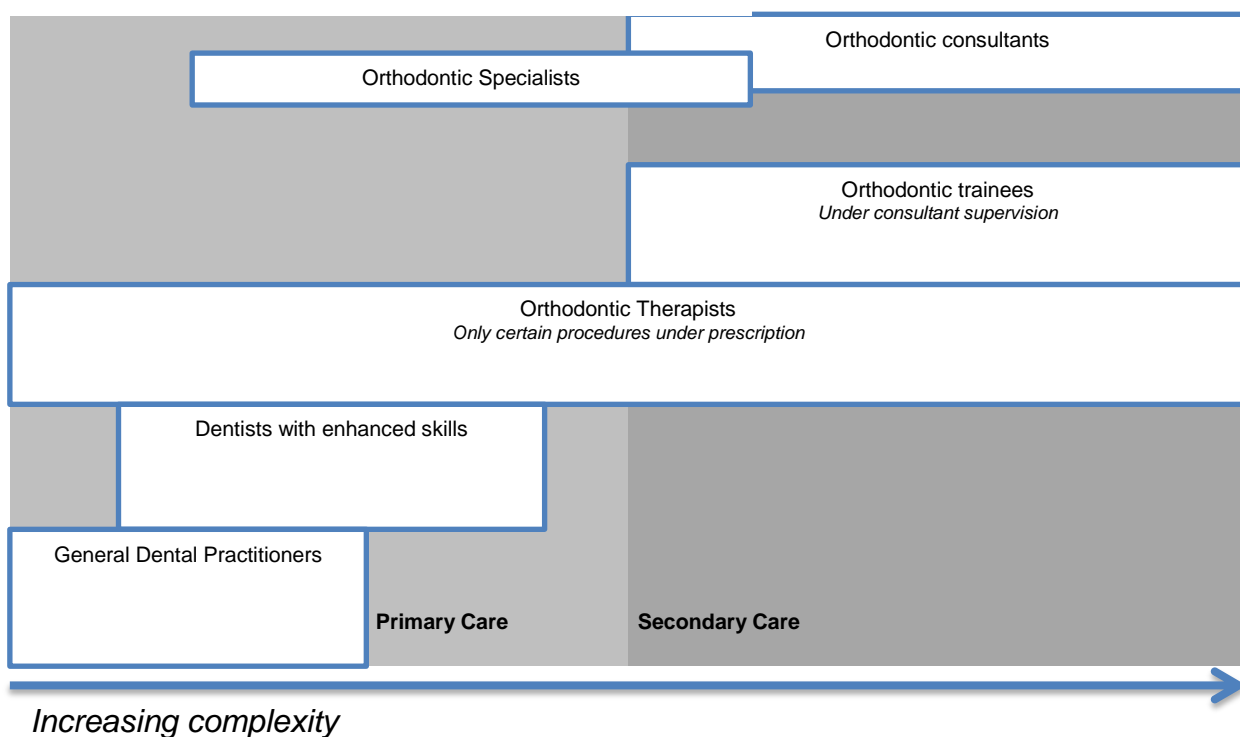
Table 18 Needs compared to contracted activity per borough

(A) Borough	(B) mean need (3 methods)	(C) contracted UOA	(D) contracted activity (C/22)	(E) % case starts available to normative need (%D/B)	(F) UOA/normative need (C/B)
Havering	996	38,815	1764	177%	39
Barking and Dagenham	976	9,503	432	44%	10
Redbridge	1332	21,988	999	75%	17
Newham	1407	38,850	1766	126%	28
Waltham Forest	1103	8,662	394	36%	8
Tower Hamlets	1020	12,156	553	54%	12
City and Hackney	1028	14,927	679	66%	15
Islington	665	0	0	0%	0
Haringey	1091	24,852	1130	104%	23
Enfield	1464	36,394	1654	113%	25
Barnet	1498	56,341	2561	171%	38
Camden	784	8,390	381	49%	11
North East Area Team	13362	270,878	12313	92%	20
Harrow	979	12,156	553	56%	12
Brent Teaching	1293	6,181	281	22%	5
Hammersmith and Fulham	568	17,107	778	137%	30
Kensington and Chelsea	493	0	0	0%	0
Westminster	671	30,644	1393	208%	46
Ealing	1388	26,031	1183	85%	19
Hillingdon	1168	14,952	680	58%	13
Hounslow	981	25,362	1153	118%	26
North West Area Team	7541	132,433	6020	80%	18
Bexley	1051	21,028	956	91%	20
Bromley	1316	31,310	1423	108%	24
Croydon	1604	38,492	1750	109%	24
Greenwich Teaching	1048	13,638	620	59%	13
Kingston	613	750	34	6%	1
Lambeth	1072	0	0	0%	0
Lewisham	1073	7,212	328	31%	7
Richmond and Twickenham	717	19,193	872	122%	27
Southwark	998	20,481	931	93%	21

Sutton and Merton	1600	37,484	1704	106%	23
Wandsworth	927	21,488	977	105%	23
South Area Team	12019	211,076	9594	80%	18

Appendix D: orthodontic treatment delivery

Figure 4 orthodontic treatment delivery



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