ORTHODONTIC TREATMENT IN UK

Overview

This document is a comprehensive collection of statistics and factual information on regulatory bodies, Orthodontic treatment and fee structure in United Kingdom (UK) which covers England, Scotland, Wales and Northern Ireland. The data is gathered from relevant research articles, and websites including WorldOMeters, Office for National Statistics (ONS) in UK, General Dental Council (GDC), British Dental Association (BDA), British Orthodontist Society (BOS), National Health System (NHS) , Care Quality Council (CQC), and British Dental Health Foundation (BDHF).

General Statistics Data

According to the WorldOMeters website, population of the United Kingdom (U.K) was **64.7 Million** in 2015 [1], with children 15 years and under accounting for about 18.8% of the total population (12.1 Million) and children between 16-18 years of age accounting for 2.2% or 1.9 Million resulting in the ratio of **adults to children 3.6:1** [2,3]. The median disposable household income for 2014/15 was estimated to be **£25,600,** while the median income for the retired households was estimated at **£21,100** and non-retired household was **£28,100** [4].

Low income is UK is defined as income that is 60% or less of the average (median) British household income in that year, in other words for 2014/2015 an income of **£15,360** or less for an individual of working age [4]. The low income rate in U.K was 21.6% (or 13.6 Million people) after deduction of the housing costs [5].

There were **40,593 dentists** and **1373 orthodontists** registered and practicing in UK as reported by the General Dental Council (GDC) in October 2015 [6]. In addition, there were **449 Orthodontic therapists** in UK and their role will be further discussed in the next section.

Therefore, in 2015 there were **62** practicing dentists and **2** orthodontists available per **100,000 populations** in UK calculated from the above information and population data [6].

General Dental & Orthodontic System in UK

There are three groups of Dental Services in UK [7].:

1. **Community Dental Services** Specialised dental services catering for people with special needs; may have mobile units that can visit home or care facilities (this is part of the NHS)
2. **General practitioner Services** Dentists in Private practices that may or may not be contracted by the National Health Services (NHS).
3. **Hospital Dental Services** part of NHS trust mainly located in teaching hospitals throughout UK. These hospitals do not provide dental care to the general public as they are highly specialised, dental schools are affiliated with teaching hospitals that cater for general public dental treatment under dental students (supervised). However, there are special cases where large number of patients are required for teaching purposes (specialized services). There are three main functions of Hospital Dental Services: To provide treatment for trauma and difficult special cases; dental care for patients of short or long stay at hospital, and treatment of certain out-patients requiring dental treatment being carried out in hospital setting.

The General Dental Practitioners (GDP) contracted by National Health System (NHS) to provide dental care to patients in 2013/2014 were approximately 78% of the total dentists in the UK [8] and about 82% in 2014/2015 [9]. In UK 56% of the population (29.8 Million) was seen by an NHS dentist during 2011-2013 period [10].

There are currently about 130,000 patients treated in independent orthodontic practices and 25,000 NHS orthodontic patients per year treated in hospital setting across the UK [11]. In some parts of the UK as there are not sufficient NHS specialist orthodontists and long waits from 6 months- 2 years or even more is expected for some patients. The UK public can receive orthodontic treatment either

privately or if they meet the criteria under NHS such as for children under 18 years of age it is at no cost. The eligibility for NHS treatment, however is still rated for these young people using a system known as the Index of Orthodontic Treatment Need (IOTN). The framework of orthodontic treatment was changed in 2006 with the introduction of the Index of Orthodontic Treatment Need (IOTN) which considers both the dental health and the aesthetics need of the patient. Usually Grade 4 and 5 cases are eligible [12].

The IOTN method was developed to prioritize NHS limited resources and the orthodontic assessment is undertaken only by a specialist orthodontist (APPENDIX A provided details on the Grading system). The following simplified summary is taken from the British Orthodontics Society (BOS) website [12]:

The IOTN has two parts, the first part is the Dental Health Component (DHC) divided into 5 separate grades and the second part is the Aesthetic Component (AC).	
Grade 1	almost perfection
Grade 2	minor issues such as: slightly irregular teeth, protruding upper front teeth or minor reversal of upper and lower relationship without interfering with normal function
Grade 3	irregularities that don't normally need treatment such as: open bite or protrusion of upper front teeth less than 4mm, reversal of the upper and lower normal relationship with minor (less than 2mm) interference and open bites without any functional issues.
Grade 4	more severe irregularity which required treatment for health reasons such as: upper front teeth protrusion greater than 6 mm, reversal of normal upper and lower relationships greater than 2 mm interference, open bite or teeth irregularity more than 4mm, deep bites with functional issues, and presence of supernumerary teeth (extra teeth)
Grade 5	very severe functional problems such as: severe crowding, large number of teeth missing, upper front teeth protrusion of greater than 9 mm, lower front teeth are more than 3.5mm protruded in front of the upper teeth and craniofacial anomalies (cleft lip and plate).

AESTHTIC COMPONENT (AC)

The second part of the IOTN is the Aesthetic Component (AC) and scaled as 10 colour photographs exhibiting different levels of dental desirability, with "1" being most attractive and "10" being least attractive arrangement of teeth. This score is reflective of aesthetic impairment and serves as a guide to the orthodontist. The grading system is decided by the orthodontist who will match the patient to the photographs. This grading system **does not** take into account chipped teeth, stained fillings, or poor gingival condition. This tool is used to explain to patients how severe their malocclusion is when compared to others (that is why), in other words it is a patient counselling tool with respect to orthodontic treatment need.

Dentist Education Requirements

In the UK, dentists undergo five years of training followed by registration with the General Dental Council (GDC). The newly qualified dentists then undertake a twelve-month Dental Foundation Training in the NHS to qualify for the NHS performer's number and become General Dental Practitioners [6]. In addition to registration with the GDC, Dentists must register with Care Quality Commission (CQC) which inspects each dental practice to ensure it meets quality and safety standards and publishes the inspection report on its website [7].

While the general dentists are not qualified as orthodontists, however they should be familiar with IOTN and be able to identify suitability of a patient as support for the specialist referral decision [6]. The role of a general dentist as support is to be able to manage the oral health of the patient during and after the orthodontic treatment is completed. The universities that offer Dentistry degree in Uk are as follows [13]:

England

Birmingham University; Barts & the London, Queen Mary Institute of Dentistry; University of Bristol School of Oral & Dental Sciences; King's College, London Dental Institute; University of Leeds Dental Institute; University of Liverpool School of Dental Sciences; University of Manchester School of Dentistry; Newcastle University School of Dental Sciences; University of Sheffield School of Clinical Dentistry; University College London Eastman Dental Institute

Scotland

University of Aberdeen; University of Dundee, and University of Glasgow Dental school

Wales

Cardiff University School of Dentistry

Northern Ireland

Queens University Belfast, Belfast Centre for Dental Education

Dentists offering Orthodontic treatment

The general dentist is able to undertake additional training to develop competency in orthodontics, however they must still refer complex cases to specialists or local hospital service. These dentists are called Dentists with Enhanced Skills (DES) [14].

These orthodontic treatment providers can be recognized by the commissioners of orthodontic care but they will be eligible for specialist list registration with the GDC. While the training used to be a two year clinical-assistantship program, however currently the program is called Longitudinal Professional Training (LPT) placements in either orthodontic specialist practices or in hospital departments [14].

Orthodontist Education Requirements

Orthodontist Speciality

General dentists wishing to undertake further training and become specialists may do so by undertaking a further three years training at one of the following 15 orthodontic schools across UK

Barts & the London School of Medicine and Dentistry, Belfast, Birmingham, Bristol, Cardiff, Dundee, Edinburgh, Glasgow, King's College London, Leeds, Liverpool, Manchester, Newcastle, Sheffield and UCL Eastman Dental Institute [15].

The General Dental Council (GDC) awards the certificate of completion of speciality training (CCST) to dentists who successfully complete the orthodontic program. An orthodontist can study a further two years to become a consultant orthodontist to lead a multidisciplinary treatment approach in a hospital setting. This is normally at a secondary care setting in a dental or district general hospital. Normally these patients have craniofacial abnormalities such as cleft lip and palate or require corrective treatment. The consultant must be competent in complex multidisciplinary care beyond their speciality training. The consultant-led passing of the Intercollegiate Specialty Fellowship Examination (ISFE) and all Annual Review of Competence Progression (ARCPs) will result in successful completion consultancy award by the Royal College of Surgeons (RCS) [6].

The current UK orthodontic workforce is divided into three groups: includes GDPs, Dentists with additional enhanced skills and experience (ESE) and the orthodontist specialists. The second group involves the consultant team at hospital and the last group is the orthodontic therapists that work under both first and second groups [6]. A simplified diagram of the relationship among these groups is presented in Figure 1.

Orthodontic Therapists

There is another addition to the orthodontic treatment team which was introduction of Orthodontic Therapists (OT) in 2007, working under guidance of a general dentist or an orthodontist specialist. The role of Orthodontic Therapists was developed to address the manpower issues in providing orthodontic treatment. Historically, evidence showed up to 50% of 11-year old children had a definitive need for orthodontic treatment and that there were less orthodontic specialists in UK than other European countries [32]. Furthermore, most orthodontists in UK had double the load of their European colleagues and as a result numerous patients did not receive specialist care. Finally, recommendations from a pilot study in Bristol in 1998 showing that it was possible to train orthodontic nurses and hygienists to perform specific orthodontic tasks led to the eventual implementation of OT training model some 10 years later.

This group undertakes 12-months of full time study of diploma in Orthodontic Therapy. There are six courses recognized by GDC in England and Wales. OTs are not permitted to work without guidance and direct supervision during delivery of a course of orthodontic care plan. The range of orthodontic procedures undertaken by OT can be found in GDC document: "*Preparing for the practice: Dental team learning outcomes for registration*" [16]. The training of OTs is hoped to increase efficiency of treatment, lessen the clinical workload of orthodontic specialists, and better management of treatment planning and more time to finish treatments. Also the expectation is that the financial burden of training orthodontic workforce will be reduced, and remote areas with greater treatment needs and limited resources will be able to take advantage of services offered by orthodontic therapists. British Orthodontic Society has carried out a workforce survey in 2014 (yet to be fully disclosed) which will help to measure the impact of introducing orthodontic therapists in UK.

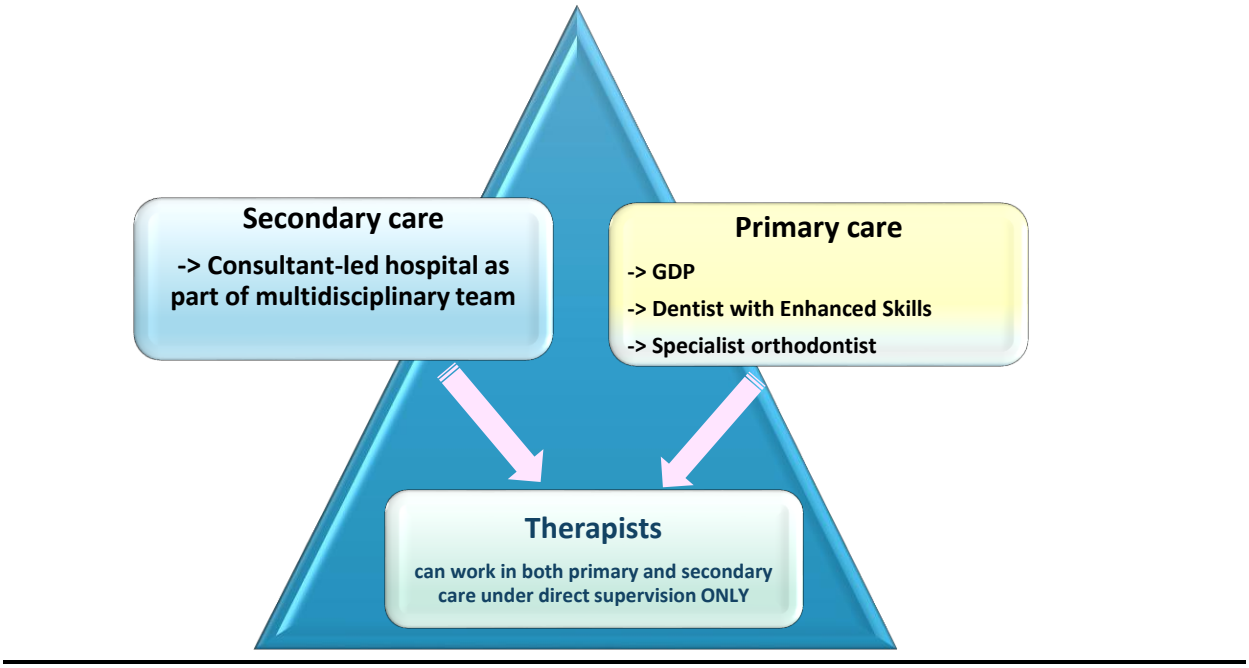

Figure 1. Simplified scheme of the current orthodontic workforce in UK.

Other Orthodontic Courses in UK

There are a number of courses throughout the UK countries available to dentists to improve their skills and knowledge on orthodontics and outside scope of this report to mention all of them. In addition, there are numerous courses for the orthodontist specialist to improve and introduce them to new treatments and modalities that become available.

One of the interesting courses for dentists is available at the London School of Facial orthotropic which was set up in 1983 and considered the oldest teaching Centre in the world. The school teaches orthotropics which is the science of influencing the facial growth direction and aims to identify symptoms and causes of malocclusion as well as finding a treatment for malocclusion [17]. The difference with orthodontics lies in the philosophy of treatment: Orthodontic objective is to create space and push teeth into alignment followed by unspecified maintenance program; Orthotropics on

the other hand aims to create a balance between lips and tongue while correcting muscle function and improving development of face holistically.

Another well-established course was started by "Excellence in Orthodontics" about 30 years ago as a two-day lecture course aimed at orthodontists who wish to expand their strategies using modern appliance with high technology [18].

Orthodontic Treatment Popularity in UK

In UK a total of **202,300** people including both adults and children have started orthodontic treatment during the 2014-2015 period, according to the British Orthodontic Society [11]. The children starting orthodontic treatment consisted of 72,300 children under 13 years old (**36%)** and 128,500 children aged 13 to 17 (**64%).** This means a ratio of adults to kids of **1: 133** which is fewer than 1:100 with only about 1,500 adults commencing orthodontic treatment last year [11].

The total number of children 12-15 years of age already under orthodontic treatment was 10-14% in 2013 [19], while the children beginning orthodontic treatment during this time were 36% under 15 years of age [20].

In UK by 2003, more than 82% of orthodontic treatment involved fixed appliances in 12–15-year-old children [20]. While currently there is no data available on orthodontic treatment during mixed dentition, a recent UK report speculates that at least 15% of the 15-year olds have permanent teeth extracted for orthodontic reasons [20]. **Table 1** summarizes the information of surveys from 1993-2013 regarding the orthodontic condition of children 12-15 years of age.

Table1. Orthodontic Conditions of children between 12-15 years of age (Source Murray et al., 2015)

Year of survey	started orthodontic Treatment	permanent teeth extracted (orthodontic reason)
1993	30%	21%
2003	32%	22%
2013	36%	15%

There are differences in use of orthodontic systems between NHS funded and private orthodontic practices: In private only practices ceramic and lingual brackets used were 15.4% and 3.8%, respectively, while in NHS only practices 3.7% used ceramic brackets [21].

The first report concerning orthodontic treatment in adults during 2007 was published in 2010 and is the only published information so far [22]. The estimated adult population treated in UK within the NHS and privately consisted of 32,600 individuals above 18 years of age [In the financial year ending April 2007]. Recent report indicates that 26% of all specialist orthodontists treat adult patients, however only 0.3% use lingual appliance [23]. The most common appliance type was aesthetic brackets or Invisalign in 69.4% of privately treated adults [22] and only 3.6% of NHS treated adults due to limited funds within the NHS.

Orthodontic Treatment Fees

There are NHS and private charges in UK and eligibility criteria has been described below. While children under 18 may qualify for NHS funded orthodontic treatment, however this funding is very limited for adult treatment. The following Table (**Table 2**) lists approximate costs associated with private orthodontic treatment [24]. **Source of Data** http://www.thedentalguide.net/braces-cost-uk

Table 2. Orthodontic Private fees

TYPE of BRACES	PRIVATE COSTS
Metal Braces	**£2,000 – £2,500 ***
**If not cosmetic treatment under NHS can expect to pay about £222.50*	
Ceramic Braces	**£2,000 – £3,000**
Lingual Braces	**£5000 – £8000**
Invisalign Braces	**£2,500 – £4,500**
Smart Bracket Braces[1]	**£2,000 – £3,000**
[1]These brackets have a small microchip that monitors their function! They cause less damage and worn for a shorter time	
Clear Braces[2]	**£3,500 – £4,500**
[2]In between metal braces and Invisalign with clear brackets.	
6 Month Smile Braces[3]	**£1,800 – £3,000**
[3] *These are short term braces and use clear wires as well as brackets. The movement forces are low and used when minor movements are only required.*	

Eligibility for Dental Treatment in Public system

The dental system in UK involved National Health Services (NHS) implemented since 1951 to cover most of the cost of dental treatment. In UK depending on location NHS charges are no more than maximum **£222.5** for a course of treatment. Scotland and Northern Ireland use the old NHS charges while in England and Wales three bands of charges exist [4].

Band 1 England **£18.80/** Wales **£13.50**

Covers examinations, x-rays, scale and polish and any other preventive treatment as well as emergency treatments.

Band 2 England **£51.30/** Wales **£43.00**

Covers fillings, Root Canal Therapy, extractions and also any band 1 treatments.

Band 3 England **£222.50/** Wales **£185.00**

Covers complex work such as dentures, crown and bridge as well as orthodontics.

NHS fully funds (provided free treatment) dental treatment for individuals who are:

- Under 18 years of age
- Under 19 years of age and enrolled in full-time study
- Pregnant or have a baby under 12 months of age
- Getting support allowance
- Getting pension
- Exempted under NHS Tax Credit Exemption Certificate.

Eligibility for Orthodontic treatment in Public System

Under the NHS program all children under 18 years of age currently have access to orthodontic assessment, but only cases that are require functional treatment are covered free of charge. NHS

adopted **IOTN** to determine children eligibility that may qualify under this scheme which has been described above [4].

The patients covered by NHS as mentioned above are fully funded for all the braces, adjustments and any repaired during the course of treatment. The exception is fees of about **£60-£70** in case the removable appliance is lost or unrepairable. Adults are generally not covered under the NHS system.

Income Test for Public Dental & Orthodontic care access

To be eligible for low income support in UK and hence access Free NHS funds, the calculations are based on an individual savings including investments to be NOT over the capital limit as follows [25]:

Residents in England or Scotland Capital Limit	Residents in Wales Capital Limit
£23, 250 for those in permanent home care arrangement care **£16,000** for everyone else	**£24, 000** for those in permanent home **£16,000** for everyone else

UK Expenditure on Dental Treatment

Government and Patient Contribution

In 2014, the NHS was rated as the best health care system in Commonwealth compared to ten other countries (Australia, Canada, France, Germany, Netherlands, New Zealand, Norway, Sweden, Switzerland and US). It was rated based on efficiency, effectiveness, safety, multidisciplinary and cost-related care system [3].

The National Health Scheme in UK covers around **£3.6** billion of dental treatment costs per year with patients only paying about **£550** million or about 15% of this total [26]. The private dental

sector generated expenditure was about **£2.2** billion, accounting for 37% of the total value of UK primary care dentistry **£5.8** billion (Figure 2) in 2013/2014 period [26].

There were 96 orthodontic primary care NHS contracts in 2013/2014 with a value of **£39** million and an additional **£22** million spent on hospital orthodontic activity in London alone [3]. The waiting period for assessment and orthodontic treatment under NHS is about 11 and 23 weeks, respectively. Hospital waiting time for orthodontic assessment is on average 6.9 weeks and 8 weeks for initiation of treatment [3]. In UK national orthodontic survey reported commencement of treatment waiting period to be 24 weeks [27].

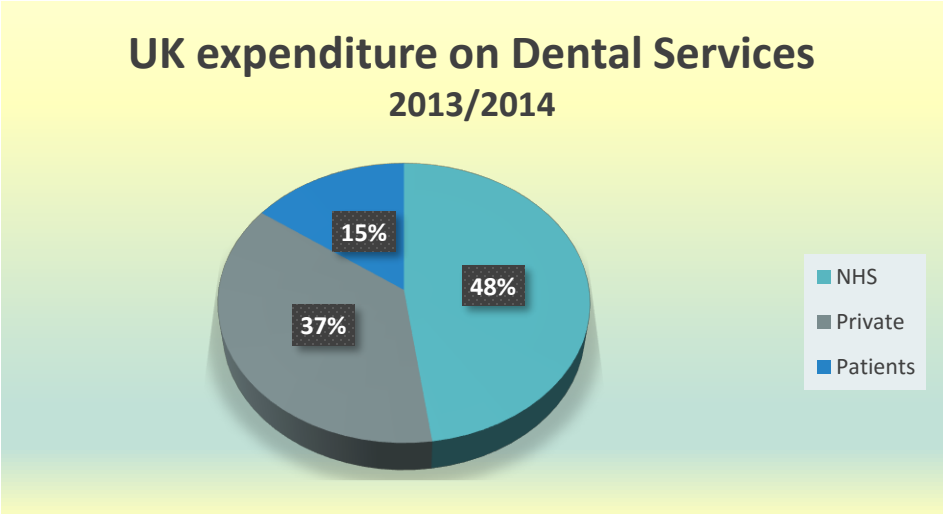

Figure 2. Percentage of Expenditure on Dental Services in UK

Source: http://www.oecd.org/health/health-systems/Focus-Health-Spending-2015.pdf

Private Health Insurance Contribution

Not all children are eligible for orthodontic treatment under NHS and in fact about 35% are found to be ineligible and may need to consider private health insurance to fund orthodontic treatment. In UK,

the private health insurance is available either through employer as a benefit arrangement or can be purchased privately from private health funds. These insurances can either contribute towards NHS costs or cover private fees. The summary of common insurance providers is presented in Table 3.

Table 3. Comparison of Dental insurance policies in UK [Source: http://www.which.co.uk/money/insurance/reviews-ns/dental-insurance/dental-insurance-policies/]

Dental Insurance Policies							
Provider	**Annual premium (60 year old)**	**Age range**	**Check-up (maintenance max benefit[a])**	**Scale polish (maintenance max benefit[a])**	**Proportion repaid**	**Treatment (max benefit)**	**Proportion repaid**
NHS Clinic only							
AXA PPP Core Cover	£123	18+	No Limit	No Limit	100%	No Limit	100%
Boots Core Plan	£117[b]	18+	£500[cd]	£500[cd]	100%	£500[cd]	100%
Bupa Dental Cover 10	£198[b]	18+	No Limit	No Limit	100%	No Limit	100%
Dencover NHS	£72[b]	18+	£18.80	£18.80	100%	£103	100%
WPA Level 1	£160[b]	18-65	No Limit	No Limit	100%	No Limit	100%
Private Clinics only/Private and NHS Clinics							
AXA PPP Premier Cover	£246	18+	£125[e]	£125[e]	100%[f]	£1,000[g]	50%
Boots Private Level 1	£171	18+	£750[d]	£750[d]	See[h]	£750[d]	See[h]
Boots Private Level 2	£249	18+	£1,000[d]	£1,000[d]	See[h]	£1,000[d]	See[h]
Bupa Dental Cover 20	£337[b]	18+	£150[e]	£150[e]	100%	£700	75%
Dencover Silver	£102[b]	18-59	£30	£35	100%[i]	£210[j]	55%
Dencover Gold	£168[b]	18-59	£55	£65	100%[i]	£410[k]	55%

Dental Insurance Policies							
Provider	**Annual premium (60 year old)**	**Age range**	**Check-up (maintenance max benefit[a])**	**Scale polish (maintenance max benefit[a])**	**Proportion repaid**	**Treatment (max benefit)**	**Proportion repaid**
Dencover Platinum	£240[b]	18-59	£80	£95	100%[i]	£610[l]	55%
Dencover Diamond	£312[b]	18-59	£105	£125	100%i	£810[m]	55%
Simplyhealth Level 1	£104	18-69	£30	£30	100%[n]	£200	50%
Simplyhealth Level 2	£174	18-69	£60	£60	100%[n]	£400[o]	50%
Simplyhealth Level 3	£246	18-69	£90	£90	100%[n]	£600[p]	50%
Simply health Level 4	£315	18-69	£120	£120	100%[n]	£800[q]	50%
WPA Providental 2	£227[b]	18-65	£250[d]	£250[d]	75%	£250[d]	75%

TABLE NOTES: All information is sourced directly from December 2015 http://www.which.co.uk/money/insurance/reviews-ns/dental-insurance/dental-insurance-policies). Bupa private policies do not include NHS cover. Maximum benefit is per year.

a. Maximum benefit is per year.
b. Starting premium for younger age groups is low
c. NHS maximum benefit for maintenance and treatment follows England and Wales NHS Banding prices
d. Maximum annual benefit for maintenance and treatment
e. Combined maximum annual benefit for check-up and scale and polish
f. £500 limit for crowns, inlays and onlays
g. 100% payout for NHS treatment
h. Number of treatments per year and amount capped according to a benefit schedule
i. 80% for scale and polish/hygiene treatment
j. £210 limit for crowns, bridges and root canals
k. £210 limit for crowns, bridges, inlays and onlays
l. £310 limit for crown, bridges and root canals
m. £410 limit for crowns, bridges and root canals
n. 75% for scale and polish
o. £200 limit for crowns, bridges. inlays and onlays
p. £300 limit for crowns, bridges, inlays and onlays
q. £400 limit for crowns, bridges, inlays and onlays

CHARITY FOUNDATIONS

The British Dental Health Foundation (BDHF) was established 40 years ago as an independent charity (non-profit) geared towards raising awareness about oral health improvement on a global scale. The foundation provides free confidential advice and educational material on oral health as well as organizes events [15]. It also organizes two annual campaigns such as "Mouth Cancer Action Month" and "National Smile Month" to increase awareness via media and encourage the profession to be more involved in active oral health education of the local communities [15]. The foundation has recently launched a free brochure on orthodontic treatment to raise awareness of orthodontics in local communities. Past year alone the foundation facilitated in more than 850 oral health promotional events; worked with hundreds of schools to promote healthy smile in young children; spread the oral health information in over 1700 media and news articles; more than 560 million people across 60 countries have received the foundation message of good oral hygiene and last year their website has had more than two million visitors to obtain information on oral health!

The foundation has sponsorship from Wrigley, Oral-B, Listerine and Invisalign to promote and run their campaigns. Other sponsors include Philips, Tepe, Denplan, Health care learning and Bupa.

Advertisement of Dental Services

There are no restrictions to advertising across UK since 1988, except the general restrictions which is advertising must be 'Truthful, decent and honest" [29]. In more recent years the competition has been fierce by some dental groups in marketing of cosmetic services. In 2012 the office of Fair trading (OFT) conducted a study that showed many patients were pressured by their dentists to sign up for advertised payment plans [30]. Also the study found an overwhelming 82% of dental patients

did not receive a written treatment plan before receiving a course of dental treatment. As a result Department of health in 2013 made a series of recommendations as follows [31]:

- Free consultation for cosmetic treatment banned to prevent people signing up because they feel obliged.
- Consultations must be with a medical professional not a sales consultant
- Strict restrictions on advertising such as banning two-for one offers, time limited deals and cosmetic surgery as competition prizes.

Resources and Data Sources

[1] http://www.worldometers.info/world-population/uk-population/

[2] http://ons.gov.uk/ons/dcp171776_422383.pdf

[3] https://www.gov.uk/government/statistics/neet-statistics-quarterly-brief-january-to-march-2015

[4] http://www.ons.gov.uk/ons/dcp171778_421593.pdf

[5] http://www.ifs.org.uk/uploads/publications/comms/R107.pdf

[6] http://www.gdc-uk.org/

[7] http://www.ageuk.org.uk

[8] https://www.england.nhs.uk/

[9] http://www.hscic.gov.uk/catalogue/PUB18129

[10] https://www.bda.org/

[11] http://www.bos.org.uk/

[12] https://www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2015/09/guid-comms-orthodontics.pdf

[13] http://www.universityadvice.co.uk/dentistry.asp

[14] Hodge, T., & Parkin, N. (2015). The twenty-first century orthodontic workforce. *Bdj Team, 1*, 15031. doi:10.1038/bdjteam.2015.31

[15] https://www.dentalhealth.org

[16] http://www.gdc-uk.org/newsandpublications/publications/publications/gdc%20learning%20outcomes.pdf

[17] http://www.lsfo.co.uk

[18] https://www.excellenceinorthodontics.com/

[19] http://www.statista.com/statistics/417918/children-receiving-orthodontic-treatment-in-united-kingdom

[20] Murray, J. J., Vernazza, C. R., & Holmes, R. D. (2015). Forty years of national surveys: An overview of children's dental health from 1973-2013. *Br Dent J, 219*(6), 281-285. doi:10.1038/sj.bdj.2015.723

[21] Banks, P., Elton, V., Jones, Y., Rice, P., Derwent, S., & Odondi, L. (2010). The use of fixed appliances in the UK: a survey of specialist orthodontists. Journal of Orthodontics, 37(1), 43-55. doi:10.1179/l46531207225022338

[22] Jawad, Z., Bates, C., & Hodge, T. (2015). Who needs orthodontic treatment? Who gets it? And who wants it? Br Dent J, 218(3), 99-103. doi:10.1038/sj.bdj.2015.51

[23] Auluck, A. (2013). Lingual orthodontic treatment: what is the current evidence base?. Journal Of Orthodontics, 40S27-S33. doi:10.1179/1465313313Y.0000000073

[24] http://www.thedentalguide.net/braces-cost-uk

[25] http://www.nhsbsa.nhs.uk/HealthCosts/1136.aspx

[26] https://www.practiceplan.co.uk Office for National Statistics. Expenditure on healthcare in the UK: 2012. www.ons.gov.uk/ons/rel/psa/expenditure-on-healthcare-in-the-uk/2012/art-expenditure-onhealthcare-in-the-uk--2012.html

[27]http://www.bos.org.uk/Resources/British%20Orthodontic%20Society/Migrated%20Resources/Documents/Workforce_survey.pdf

[28] http://www.which.co.uk/money/insurance/reviews-ns/dental-insurance/dental-insurance-policies

[29] Newsome, P. R. H., & Langley, P. P. (2014). Professionalism, then and now. *Br Dent J, 216*(9), 497-502. doi:10.1038/sj.bdj.2014.355

[30] Office of Fair Trading. (2012). Dentistry, an OFT market study. London: OFT

[31] Keogh B. (2013). Review of the Regulation of Cosmetic Interventions. London: Department of Health

[32] Bain S, Lee W, Day CJ , et al. Orthodontic therapists – the first Bristol cohort. *Br Dent J* 2009; **207**:227–230.http://www.nature.com/bdj/journal/v207/n5/full/sj.bdj.2009.766.html

Key terminology

BDA British Dental Association is the professional association and trade union for dentists in the United Kingdom.

BOS British orthodontist Society

Income This is measured as total weekly household income from all sources after tax (including child income), national insurance and other deductions. An

DES Dentist with Enhanced Skills

DHC Dental Health Component

FT Foundation Trainee

GDC General Dental Council

GDP General Dental Practitioner

GDS General Dental Services

IOTN Index of Orthodontic Treatment Need

NTN National Training Number

ONS Office of National Statistics

APPENDEX A

1.1 Summary of IOTN

In order to qualify for free NHS treatment, a patient must be under 18 years of age (adult cases are decided individually and usually not funded) and show an obvious need rather than desire for treatment.

The need is guided by the IOTN criteria as follows:

IOTN scale (see detailed description 1.2) a patient is first graded as 1, 2, 3, 4 or 5 on the Dental Health Component.

Grade 1 does not need treatment while **grade 5** is in great need of treatment.

Assessment of **Grade 3** will further prompt allocation of a grade between 3.1 and 3.10 by application of the Aesthetic Component (**AC**).

Eligibility for free NHS treatment: Overall score must be **3.6** or higher.

1.2 THE FULL IOTN DHC TABLE

Grade 5 (Need treatment)

5•i Impeded eruption of teeth (except for third molars) due to crowding, displacement, the presence of supernumerary teeth, retained deciduous teeth and any pathological cause.

5•h Extensive hypodontia with restorative implications (more than 1 tooth missing in any quadrant) requiring pre-restorative orthodontics.

5•a Increased overjet greater than 9 mm.

5•m Reverse overjet greater than 3•5 mm with reported masticatory and speech difficulties.

5•p Defects of cleft lip and palate and other craniofacial anomalies.

5•s Submerged deciduous teeth.

Grade 4 (Need treatment)

4•h Less extensive hypodontia requiring pre-restorative orthodontics or orthodontic space closure to obviate the need for a prosthesis.

4•a Increased overjet greater than 6 mm, but less than or equal to 9 mm.

4•b Reverse overjet greater than 3•5 mm with no masticatory or speech difficulties.

4•m Reverse overjet greater than 1 mm but less than 3•5 mm with recorded masticatory and speech difficulties.

4•c Anterior or posterior crossbites with greater than 2 mm discrepancy between retruded contact position and intercuspal position.

4•l Posterior lingual crossbite with no functional occlusal contact in one or both buccal segments.

4•d Severe contact point displacements greater than 4 mm.

4•e Extreme lateral or anterior open bites greater than 4 mm.

4•f Increased and complete overbite with gingival or palatal trauma.

4•t Partially erupted teeth, tipped and impacted against adjacent teeth.

4•x Presence of supernumerary teeth.

Grade 3 (Borderline need)

3•a Increased overjet greater than 3•5 mm, but less than or equal to 6 mm with incompetent lips.

3•b Reverse overjet greater than 1 mm, but less than or equal to 3•5 mm.

3•c Anterior or posterior crossbites with greater than 1 mm, but less than or equal to 2 mm discrepancy between retruded contact position and intercuspal position.

3•d Contact point displacements greater than 2 mm, but less than or equal to 4 mm.

3•e Lateral or anterior open bite greater than 2 mm, but less than or equal to 4 mm.

3•f Deep overbite complete on gingival or palatal tissues, but no trauma.

Grade 2 (Slight)

2•a Increased overjet greater than 3•5 mm, but less than or equal to 6 mm with competent lips.

2•b Reverse overjet greater than 0 mm but less than or equal to 1 mm.

2•c Anterior or posterior crossbite with less than or equal to 1 mm discrepancy between retruded contact position and intercuspal position.

2•d Contact point displacements greater than 1 mm but less than or equal to 2 mm.

2•e Anterior or posterior open bite greater than 1 mm but less than or equal to 2 mm.

2•f Increased overbite greater than or equal to 3•5 mm without gingival contact.

2•g Pre- or post-normal occlusions with no other anomalies (includes up to half a unit discrepancy).

Grade 1 (None)

1• Extremely minor malocclusions including contact point displacements less than 1 mm.