NHS orthodontic services in Wales: orthodontic workforce distribution and primary care commissioned activity in 2021

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Key points

The amount of NHS commissioned primary orthodontic activity within Wales is 76% of what is potentially required to meet the annual need.

Primary care orthodontic services are efficient, with 97.1% of commissioned activity being used to provide treatment.

There are 112 GDC registered clinicians who provide NHS orthodontic care within Wales: 52 specialists, 24 dentists with a special interest, 32 orthodontic therapists and 3 orthodontic trainees (specialty registrar 1–3), providing 694.4 sessions of NHS orthodontic activity per week over 47 locations.

Abstract

Objectives 1) To ascertain the volume of primary care orthodontic activity commissioned within Wales and compare this to the 12-year-old population; and 2) To ascertain the orthodontic workforce undertaking NHS orthodontic provision within Wales and their distribution.

Methods Information was gathered between September and November 2021 from multiple sources within Wales, including: Freedom of Information requests; Welsh Government statistics; orthodontic professional networks; orthodontic provider websites; health boards (HBs); and directors of primary care/contracting/commissioning.

Results The HBs had varying levels of orthodontic need and commissioned activity with a significant amount of cross border activity in South Wales. Overall, it indicated that Wales was only commissioning orthodontic activity to meet 76% of the annual orthodontic need. Overall, 97.9% of commissioned primary care orthodontic activity was being used to provide treatment for 9,500 patients per year. Furthermore, 112 GDC-registered clinicians provide NHS orthodontic care within Wales – 52 orthodontic specialists; 32 orthodontic therapists; 24 DwSIs; and 4 orthodontic trainees (StR 1–3). NHS orthodontic care is provided at 47 sites within Wales – 32 sites in the GDS/Specialist Practice, 6 sites within the CDS and 9 secondary care settings.

Conclusions NHS commissioned primary care orthodontic activity within Wales is 76% of the potential orthodontic annual need. Primary care orthodontic services are efficient with 97.9% of commissioned activity being used to provide treatment. In total, 112 GDC-registered clinicians provide NHS orthodontic care across 47 sites within Wales, with 29.5% of clinicians working at multiple sites. The distribution of the orthodontic providers is predominately in areas of high population density, resulting in some rural communities being a significant distance from any orthodontic provider.

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Introduction

Over the last 15 years, there have been a number of national inquiries and reviews into orthodontic provision within Wales. The first of these was the National Assembly for Wales Health, Wellbeing and Local Government Committee's Review into orthodontic services in Wales, the results of which were published in February 2011.[1] This review was undertaken due to the increasing number of concerns raised by constituents regarding the availability of, and time to access, appropriate orthodontic care.

While it was recognised that the amount of commissioned activity was similar to that when the 'new contract', along with units of orthodontic activity (UOAs), was introduced in 2006, it was felt that there were steps that could be taken to reduce inappropriate referrals and increase the efficiency of the service to allow more patients to be receive care in a quicker timeframe.

The Committee produced 17 recommendations which aimed to: gather more evidence regarding relative clinical need and contracted provision; improve the efficiency and quality of the care provided; reduce waste; develop the workforce; and establish local orthodontic managed clinical networks throughout Wales.

The results of a follow-up inquiry were published in July 2014 by the National Assembly for Wales Health and Social Care Committee.[2] The Committee welcomed the progress which had been made but concluded that there was still work to do in order to address the inherent

inefficiency within the service and the resultant significant waiting times across the country. Six further recommendations were made.

In response, the Office of the Chief Dental Officer of Wales commissioned three major pieces of research by Professor Richmond. The first was a *Review of the orthodontic services in Wales 2013–14*.[3] It found that there had been a significant reduction in the number of 'assessment and review' claims, which, in part, had resulted in an increase in treatment provision by over 500 cases per year since 2011. It was concluded that the resources which were currently commissioned within Wales should be sufficient to manage the orthodontic need on an annual basis. Professor Richmond made a series of recommendations for the Welsh Government and orthodontic providers. His second follow-on report entitled *Review of the orthodontic services in Wales 2008–2009 to 2015–2016*[4] had a wider scope and also investigated the effects of the retendering of orthodontic services, which demonstrated: an increase in case starts; an equalisation and reduction in UOA value; and a reduction in the number orthodontic contracts across Wales from 133 to 82.

Professor Richmond's third report was a *Review of the orthodontic waiting list in Wales, 2017*.[5] His subsequent recommendations included: a centralised waiting list within each health board (HB); reprioritisation of waiting lists based on clinical need rather than time of referral; and review of smaller contracts to determine if they are fit for purpose.

Some of the 'efficiencies' which were envisaged were based on several assumptions, including the benefits of economies of scale and maximising the use of the whole clinical team with particular focus on orthodontic therapists. Although this approach may be very effective for locations with large population densities, it may not be as appropriate for rural areas where the allocation of orthodontic provision to 'regional centres' could result in accessibility issues for patients accessing orthodontic treatment every 6–8 weeks over a two-year period. It is also noted that although 'it was felt that the current commissioning was sufficient to meet the need annually' it did not take into account the historic cohort of patients who had been referred but were still waiting to access treatment, for example, the 'waiting list'.

Although the reports highlighted above looked at the number of 'orthodontic providers' undertaking NHS orthodontic activity, this was based on the number of orthodontic contracts the HBs had issued, rather than the number of individuals undertaking the provision of orthodontic care. As such, they did not identify the type of provider, working profile, or their location. The *Report of the orthodontic workforce survey of the United Kingdom February 2005*[6] provided some useful data on a UK-wide basis, but as it amalgamated England and Wales, it did not provide detailed information on the orthodontic workforce in Wales. Also, this survey was undertaken before the establishment of the 'new contract', Welsh Government Inquires and modernisation programme.

This lack of detailed information regarding the NHS orthodontic workforce within Wales means it is difficult to ensure that the training requirements can be identified to ensure workforce sustainability for the future.

It was with this in mind that this project was instigated with the following objectives:

- To ascertain the volume of primary care orthodontic activity commissioned and compare this to the 12-year-old population
- To ascertain the orthodontic workforce undertaking NHS orthodontic provision within Wales and their distribution.

Methods

The project was devised and instigated by the lead investigator (BRKL), who also acted as the data controller, in his capacity as Chair of the North Wales and Powys Orthodontic Managed Clinical Network (OMCN). The aim was to produce accurate, quantifiable information on the orthodontic workforce across the whole of Wales. This was done in response to a request to the Welsh OMCNs for information on local training requirements by Health Education and Improvement Wales. Consultant orthodontists across Wales were recruited as local data collectors, as it was felt that they would have the best overarching knowledge of the orthodontic service provision within their own HB as well as neighbouring ones. In additional to their own personal professional networks, it allowed access to the three orthodontic managed clinical networks operating within Wales.

Data were also obtained from publicly available resources, such as statswales.gov.wales[7] and orthodontic provider websites; Freedom of Information requests; primary care directors; and contract managers within the HBs. This allowed improved data collection, as well as providing a method of cross-checking the various data streams to ensure they was both accurate and complete.

The amount of primary-care-commissioned orthodontic activity was obtained for each HB as UOAs. This was then divided by 22.5 to produce the nominal number of case starts expected. The figure of 22.5 was used as this is one of the primary key performance indicators utilised in monitoring orthodontic contracts across Wales as equating to an individual 'case start'.

The number of 12-year-olds within HBs was obtained via the Welsh Government's statistics office[8] and this was divided by three to produce the nominal 'orthodontic need' within Wales and also within each HB. Although this results in a reduced 'need' when compared to the 'Stephen's formula' as used in the *Report of the orthodontic workforce survey of the United Kingdom 2005*,[6] it was felt to be more applicable to Wales as the needs assessments undertaken before the retendering exercises within Wales generally use 'one-third of 12-year-olds' as a measurement of expected orthodontic need when calculating the required amount of orthodontic activity to be commissioned.

This enabled us to create a ratio of 'perceived orthodontic need' to 'orthodontic commissioned activity', with a score of one meaning that they were in balance, a score of less than one meaning that insufficient activity was being commissioned, and a score of greater than one indicating potential over commissioning of orthodontic services.

A workforce data collection sheet was agreed by the investigating team and was piloted within North Wales. Modifications were made to ensure the robustness and clarity of the form, which recorded the provider, the name and grade of the clinician and the total number of sessions (based on 3.75 hours) spent undertaking NHS orthodontic activity, along with the breakdown of the number of clinical and non-clinical sessions within this total. Workforce data were gathered across Wales from September to November 2021. These were only collected for those individuals undertaking their NHS orthodontic practice within Wales and not for any Welsh NHS orthodontic activity performed in England. Each provider and performer were allocated a unique reference number to ensure anonymisation during data analysis but which enabled identification of any performers working in multiple environments within a single HB and within different HBs. The data

Table 1 Child population and commissioned orthodontic activity per health board (June 2021)

Health Board	No. of children aged 10–18	No. of 12-year-olds	One-third of 12-year-olds	No. of UOA	No. of case starts	Ratio of case starts: one-third of 12-year-olds
Aneurin Bevan University Health Board	55,932	7,342	2,447.3	31,445	1,397.6	0.57
Betsi Cadwaladr University Health Board	64,046	8,436	2,812	38,504	1,711.3	0.61
Cardiff and Vale University Health Board	45,321	6,087	2,029	64,558	2,869.2	1.41
Cwm Taf Morgannwg University Health Board	41,127	5,349	1,783	9,135	406	0.23
Hywel Dda University Health Board	34,495	4,521	1,507	26,500	1,177.8	0.78
Powys Teaching Health Board	11,314	1,487	495.7	7,691	341.8	0.69
Swansea Bay University Health Board	34,118	4,454	1,484.7	37,943	1,686.4	1.14
Total	**286,353**	**37,676**	**12,558.7**	**215,776**	**9,590**	**0.76**

were transferred into an Excel document for analysis and the results tabulated. Only Wales and HB-level data will be presented to ensure the anonymity of the clinicians due to the small perceived risk that working patterns could identify a particular individual.

The addresses of the orthodontic providers which are commissioned to provide NHS orthodontic activity were provided by each of the seven HBs within Wales and this allowed them to be plotted on a map of Wales to visually demonstrate the distribution of clinical services.

Results

The number of 12-year-olds within Wales, the commissioned activity and the ratio between 'need' to 'activity' are shown in Table 1. This indicated that there is significant variability between the HBs, both with regard to the number of individuals who would potentially benefit from orthodontic treatment and the amount of commissioned orthodontic activity. Overall, it indicated that Wales was only commissioning orthodontic activity to meet 76% of the annual orthodontic need as of June 2021.

Tables 2, 3, 4, 5, 6, 7 and 8 show the orthodontic workforce within each of the HBs. The number of sessions have been used to calculate the number of whole-time equivalents (WTE) and the anonymised labelling has allowed a total head count to be produced within each HB, as well as a location head count. The results show that Cardiff and Vale University HB (UHB) have the greatest number of clinicians, specialists and WTEs, with Powys Teaching HB having the least. This roughly equates to the associated commissioned level of activity within each HB. Betsi Cadwaladr UHB have the highest number of dentists with a special interest (DwSI) and Swansea Bay UHB had the highest number of orthodontic therapists. Understandably, Cardiff and Vale UHB have the greatest number of orthodontic trainees as this is the location for the University of Cardiff's Dental Hospital, which is Wales' main orthodontic training establishment.

Table 2 Aneurin Bevan University Health Board orthodontic workforce summary

Grade of clinician	Total headcount	Location headcount	Whole time equivalent	Total	Clinical	Non-clinical	Number of locations
Consultant	3	4	2.1	21	15	6	2
Specialist	12	13	4.45	44.5	39.5	5	8
Accredited DwSI	1	1	0.1	1	1	0	1
DwSI	0	0	0	0	0	0	0
Orthodontic therapist	2	2	0.5	5	5	0	2
StR4–5	1	1	0.2	2	2	0	1
StR1–3	0	0	0	0	0	0	0
Trainee DwSI	0	0	0	0	0	0	0
Trainee orthodontic therapist	0	0	0	0	0	0	0
Total	**19**	**21**	**7.35**	**7.35**	**62.5**	**11**	**10**

Note:
Three secondary care consultants also work as specialists in primary care, two within the HB and one in a neighbouring HB.
The StR4–5 is split between this HB and a neighbouring HB.
Locations: primary care = 8; community dental services = 0; secondary care = 2.

The breakdown of the orthodontic workforce practising within Wales is shown in Table 9. The 'total headcount' is calculated for each grade of clinician; however, there will be overlap due to the fact that some clinicians work in a number of different settings and as a different 'grade'. As the term 'consultant' is an honourary NHS title, when these individuals are working in primary care, they are included under the term 'specialist'. This is clarified at the bottom of Table 9, which highlights that the total number of clinicians registered with the General Dental Council (GDC) providing NHS orthodontic care within Wales is 112. This includes 52 clinicians on the GDC's orthodontic specialist list (which for the purpose of this review included specialists working in primary care, the community dental services or secondary care, orthodontic consultants and specialist registrars [StR] 4–5); 32 orthodontic therapists (either qualified or in training); 24 DwSI; and four orthodontic speciality trainees (StR1–3). These clinicians are working across 47 sites within Wales: 32

sites in the general dental services or specialist practice, six sites within the community dental services, and nine in secondary care settings.

The locations of the orthodontic providers who are commissioned by the HBs are visually represented in Figure 1. This shows the distribution of the orthodontic providers in predominately areas of high population density, such as major towns and cities. However, it appears to result in vast swathes of the country being large distances from any orthodontic provider.

Discussion

The results of this investigation appear to show that the level of orthodontic commissioned activity is only around three-quarters of that which is required according the 'one-third of 12-year-olds' metric. However, this will not be the whole picture. The long border between Wales and England results in bilateral cross-border activity in all aspects of life. This includes accessing healthcare services generally, and orthodontic provision in particular. This is due to a number of factors, including the location of patients' general dental practitioner, historic referral pathways and transportation networks. This historic activity will have been entrenched within established orthodontic contracts when the 'new contract' came into effect in 2006, as the level of activity was based on the previous two years' worth of submissions to the Dental Practice Board when orthodontics was funded on a 'fee per item' basis.

In addition to this, the amount of primary care funding will not include any activity within the community dental service where they operate in Betsi Cadwaladr UHB and Cwm Taf Morgannwg UHB. It will also exclude the clinical caseload which is undertaken within the secondary care services, as these are funded by each individual HB where they are located, along with 'block' contracts with neighbouring HBs or providers in England for those who do not directly provide secondary-care-based orthodontic services such as Powys Teaching HB and Hywel Dda UHB. Betsi Cadwaladr UHB also holds a "block" contract with the Countess of Chester hospital for a range of services including some orthodontic activity.

Another feature which was initially surprising was the discrepancy between the level of orthodontic activity commissioned between the different HBs, with Cardiff and Vale UHB and Swansea Bay UHB appearing to over-commission and the remaining HBs under-commissioning, some significantly, like Cwm Taf Morgannwg UHB, which only appears to provide 23% of the level of activity required. However, it is likely that this apparent discrepancy is again due to the legacy of when the 'new contract' was introduced. South East Wales has a high population density as a result of its industrial past, with the areas of Cardiff, Newport, Bridgend, Neath and Swansea forming the major populations centres, so it would be expected that these areas have the greatest

Table 3 Betsi Cadwaladr University Health Board orthodontic workforce summary

Grade of clinician	Total headcount	Location headcount	Whole time equivalent	Total	Clinical	Non-clinical	Number of locations
Consultant	5	6	3.9	39	29.1	9.9	3
Specialist	5	5	2.65	26.5	23.5	3	4
Accredited DwSI	9	14	3.05	30.5	28	2.5	12
DwSI	1	1	0.05	0.5	0.5	0	1
Orthodontic therapist	7 (8)	9	4.6	46	44	2	5
StR4–5	1	1	0.35	3.5	3.33	0.17	1
StR1–3	1	1	0.5	5	4.5	0.5	1
Trainee DwSI	2	2	0.4	4	4	0	1
Trainee orthodontic therapist	1	1	0.8	8	8	0	1
Total	**32 (33)**	**40**	**16.3**	**163**	**144.93**	**18.07**	**14**

Note:
One orthodontic therapist on maternity leave with clinical sessions covered by existing staff
One primary care specialist also works in a neighbouring HB.
Commissioned activity also provided by Countess of Chester Hospital.
Locations: primary care = 7; community dental services = 4; secondary care = 3.

Table 4 Cardiff & Vale University Health Board orthodontic workforce summary

Grade of clinician	Total headcount	Location headcount	Whole time equivalent	Total	Clinical	Non-clinical	Number of locations
Consultant	6	6	4	40	29	11	1
Specialist	11	13	7	70	67	3	4
Accredited DwSI	0	0	0	0	0	0	0
DwSI	3	4	1.6	16	15	1	2
Orthodontic therapist	6	6	4.3	43	43	0	2
StR4–5	1	1	0.4	4	3	1	1
StR1–3	3	3	0.9	9	6	3	1
Overseas trainee	9	9	6.3	63	54	9	1
Trainee DwSI	0	0	0	0	0	0	0
Trainee orthodontic therapist	0	0	0	0	0	0	0
Total	**39**	**42**	**24.5**	**245**	**217**	**28**	**5**

Note:
Two secondary care consultants also work as specialists in primary care, one within the HB and one in a neighbouring HB.
Two primary care specialists work across three separate HBs.
One orthodontic therapist works across two separate HBs.
The StR4–5 is split between this HB and a neighbouring HB.
The three StR1–3 are split between this HB and a neighbouring HB.
Locations: primary care = 4; community dental services = 0; secondary care = 1.

concentration of clinical services and the associated high-quality transport infrastructure enabling those from the surrounding areas to gain access to these services. As such, it is likely that the historic orthodontic service provided by the health commissioning entities which preceded the formation of Cardiff and Vale UHB and Swansea Bay UHB have continued.

Welsh Government statistics (30 September 2021)[9] indicates that around 9,500 treatments were undertaken each year between 2015–2016 and 2019–2020. The delivery of orthodontics in primary care for 2021 and 2022 in response to the COVID-19 pandemic[10] showed that, for primary care orthodontic services in 2019/20, 201,393 UOAs were completed and of that, 97.9% was utilised on providing treatment, 1.4% on 'assessment and review' and 0.6% on 'assess and refuse treatment'. Data from the NHS Business Services Authority regarding the orthodontic treatment undertaken within contracts based in Wales in the 2018/2019 reporting year[11] show the number of clinical cases who had their treatment episode closed. This indicated that 94.3% of treatment was completed, 3.4% abandoned and 2.3% discontinued. These results are much more favourable when compared with previously published results regarding failure to complete treatment results.[12] These figures demonstrate that, as a result of the Welsh Government's interventions and the lead taken by the Chief Dental Officer of Wales, the HBs and the orthodontic managed clinical networks, Wales now has a greatly more efficient primary care orthodontic service.

However, even taking these aspects into consideration, it still appears that NHS orthodontic primary care commissioning across Wales as a whole is insufficient to meet the needs of the child population on an annualised basis. This is also not taking into consideration the historic cohort of patients who have been referred for orthodontic assessment and possible treatment but are yet still waiting to be seen.

Figure 1 visually demonstrates the locations of the orthodontic providers across Wales. Understandably, the location of providers tends to be around centres of high population density, such as the north and south coasts of Wales. However, this does result in some rural communities being a considerable distance from an orthodontic provider. This is further complicated by the topography of Wales and the resulting transportation networks which can be variable and convoluted. For one-off medical appointments, a significant travelling distance may not be a barrier to access care; however, for orthodontic treatment to be successful, it requires visits every 4–8 weeks over a 2+ year period. This is likely to put a significant burden on those travelling a large distance to access care, both with transportation costs and time off education/work.

Table 5 Cwm Taf Morgannwg University Health Board orthodontic workforce summary

Grade of clinician	Total headcount	Location headcount	Whole time equivalent	Total	Clinical	Non-clinical	Number of locations
Consultant	1	1	0.9	9	8	1	1
Specialist	3	3	1.4	14	14	0	3
Accredited DwSI	2	4	0.5	5	4.3	0.7	3
DwSI	1	2	0.2	2	1.75	0.25	2
Orthodontic therapist	3	3	1.5	15	15	0	1
StR4–5	0	0	0	0	0	0	0
StR1–3	3	3	1.2	12	9	3	1
Trainee DwSI	0	0	0	0	0	0	0
Trainee orthodontic therapist	0	0	0	0	0	0	0
Total	**13**	**16**	**5.7**	**57**	**52.05**	**4.95**	**7**

Note:
One primary care specialist works across three separate HBs.
One DwSI works across two separate HBs.
Two orthodontic therapists work across two separate HBs.
The three StR1–3 are split between this HB and a neighbouring HB.
Locations: primary care = 4; community dental services = 2; secondary care = 1.

Table 6 Hywel Dda University Health Board orthodontic workforce summary

Grade of clinician	Total headcount	Location headcount	Whole time equivalent	Total	Clinical	Non-clinical	Number of locations
Consultant	Secondary care orthodontic services contracted to Morriston Hospital (Swansea Bay UHB)						1
Specialist	4	6	2.4	24	24	0	3
Accredited DwSI	0	0	0	0	0	0	0
DwSI	0	0	0	0	0	0	0
Orthodontic therapist	3	4	1.9	19	19	0	2
StR4–5	0	0	0	0	0	0	0
StR1–3	0	0	0	0	0	0	0
Trainee DwSI	0	0	0	0	0	0	0
Trainee orthodontic therapist	0	0	0	0	0	0	0
Total	**7**	**10**	**4.3**	**43**	**43**	**0**	**5**

Note:
Two primary care specialists work across three separate HBs.
One additional orthodontic contract held with a specialist practice in a neighbouring HB.
Locations: primary care = 4; community dental services = 0; secondary care = 1.

This investigation has, for the first time, provided a complete summary of the NHS orthodontic workforce practising in Wales, along with their locations. It has shown that five orthodontic consultants also undertake orthodontic treatment for NHS patients within primary care, which equates to 29.4% of the orthodontic consultant body and 13.2% of

the primary care specialists. It has also been revealed that within Wales, over 29.5% of clinicians work on multiple sites, for different employers, across different HBs (Table 9).

These are very important aspects to consider when looking at workforce planning, as each area within orthodontic service provision cannot be viewed in isolation. Loss of a 'performer' could affect multiple 'providers', especially if this clinician was a specialist and providing treatment planning and supervision roles for other members of the orthodontic team. For the service to operate efficiently and effectively, all the various providers need to be working symbiotically. Failures of provision in one area will have knock-on consequences on neighbouring providers. This isn't just limited to orthodontic intervention. Challenges experienced in associated disciplines will also have an impact, such as waiting times for minor oral surgery in secondary care, or delays in restorative work and orthodontically related extractions in primary care.[13]

The results tables demonstrated the time spent by each performer on NHS orthodontic activity. Within Wales (Table 9), this equated to 7.4 sessions per consultant, 5.7 sessions per primary care specialist, 3.2 sessions per DwSI and 7.2 sessions per orthodontic therapist. As mentioned above, there will be crossover between the consultant body and primary care specialists and the lower number of average sessions undertaken by DwSI is understandable, as many will also be undertaking general dental sessions. This study also shows the variation within the orthodontic workforce practising within each HB (Tables 2, 3, 4, 5, 6, 7 and 8). These variations provide an insight into the different operating models which each HB has commissioned to meet their individual needs, for example, the use of DwSI in geographically remote areas; as well as highlighting potential vulnerabilities with regards to future recruitment and retention. However, it must be noted that this investigation only looked at NHS orthodontic activity and, by nature of the methodology utilised, was unable to determine other clinical and non-clinical activity, which may be being undertaken outside the NHS or in areas not related to orthodontics.

Potential limitations of this study are that, due to the methodology used, it was not possible to ascertain working patterns or what proportion of the workforce work full time, less than full time or greater than full time, as this may include aspects not related to NHS orthodontic activity. In addition, the data were collected over a three-month period, during which time there is the possibility that the workforce could have changed following initial data submission. The time period could have been shortened; however, working with multiple agencies across the whole of Wales meant the data collection was dictated by the response time of those external bodies.

Table 7 Powys Teaching Health Board orthodontic workforce summary

Grade of clinician	Total headcount	Location headcount	Whole time equivalent	Total	Clinical	Non-clinical	Number of locations
Consultant	Secondary care orthodontic services contracted out to neighbouring areas: Royal Shrewsbury Hospital (England). Brecon War Memorial Hospital (Outreach service provided Prince Charles Hospital, Merthyr Tydfil - [Cwm Taf Morgannwg UHB] and Wrexham Maelor Hospital [Betsi Cadwaladr UHB]).						3 (1x England and 2x Wales)
Specialist	2	2	0.34	3.4	3.4	0	2
Accredited DwSI	0	0	0	0	0	0	0
DwSI	1	1	0.2	2	2	0	1
Orthodontic therapist	0	0	0	0	0	0	0
StR4–5	0	0	0	0	0	0	0
StR1–3	0	0	0	0	0	0	0
Trainee DwSI	0	0	0	0	0	0	0
Trainee orthodontic therapist	0	0	0	0	0	0	0
Total	**3**	**3**	**0.54**	**5.4**	**5.4**	**0**	**7**

Note:
In addition to the data above, two commissioned primary care specialist providers operate from England.
One primary care specialist works across two separate HBs.
Locations (England & Wales): primary care = 4; community dental services = 0; secondary care = 3.

Table 8 Swansea Bay University Health Board orthodontic workforce summary

Grade of clinician	Total headcount	Location headcount	Whole time equivalent	Total	Clinical	Non-clinical	Number of locations
Consultant	2	2	1.7	17	9.5	7.5	1
Specialist	7	7	3.5	35	35	0	2
Accredited DwSI	0	0	0	0	0	0	0
DwSI	5	5	1.6	16	14.8	1.2	4
Orthodontic therapist	12	12	8.65	86.5	79.5	7	4
StR4–5	2	2	1.6	16	13	3	1
StR1–3	0	0	0	0	0	0	0
Trainee DwSI	0	0	0	0	0	0	0
Trainee orthodontic therapist	0	0	0	0	0	0	0
Total	**28**	**28**	**17.05**	**170.5**	**151.8**	**18.7**	**6**

Note:
One secondary care consultant also works as a specialist in primary care.
One StR4–5 also works as a specialist in primary care.
One primary care specialist works across two separate HBs.
One DwSI works across two separate HBs.
One orthodontic therapist works across two separate HBs.
Locations: primary care = 5; community dental services = 0; secondary care = 1.

Table 9 All Wales orthodontic workforce summary

Grade of clinician	Total headcount	Location headcount	Whole time equivalent	Total	Clinical	Non-clinical	Number of locations
Consultant	17	19	12.6	126	90.6	35.4	8
Specialist	38	49	21.74	217.4	206.4	11	26
Accredited DwSI	12	19	3.65	36.5	33.3	3.2	16
DwSI	10	13	3.65	36.5	34.05	2.45	10
Orthodontic therapist	30 (31)	36	21.45	214.5	205.5	9	17
StR4–5	4	5	2.55	25.5	21.33	4.17	4
StR1–3	4	7	2.6	26	19.5	6.5	2
Overseas trainee	9	9	6.3	63	54	9	1
Trainee DwSI	2	2	0.4	4	4	0	1
Trainee orthodontic therapist	1	1	0.8	8	8	0	1
Total	**127 (128)**	**160**	**75.74**	**757.4**	**676.68**	**80.72**	**47**

Note:
NHS workforce working within Wales = 112.
Orthodontic performer headcount within Wales: orthodontic specialists (working in primary care, CDS, and secondary care) = 52; DwSI = 24; orthodontic therapists = 32 (one on maternity leave); StR1–3 = 4.
Practitioners providing NHS orthodontic services across multiple sites within Wales: 33 (29.5%) – DwSI = 8 (33.3%); orthodontic therapists = 6 (18.8%); StR1–3 = 3 (75%); orthodontic specialists = 16 (30.8%).
Locations with Wales = 47, comprising of: primary care = 32; community dental services = 6; secondary care = 9.

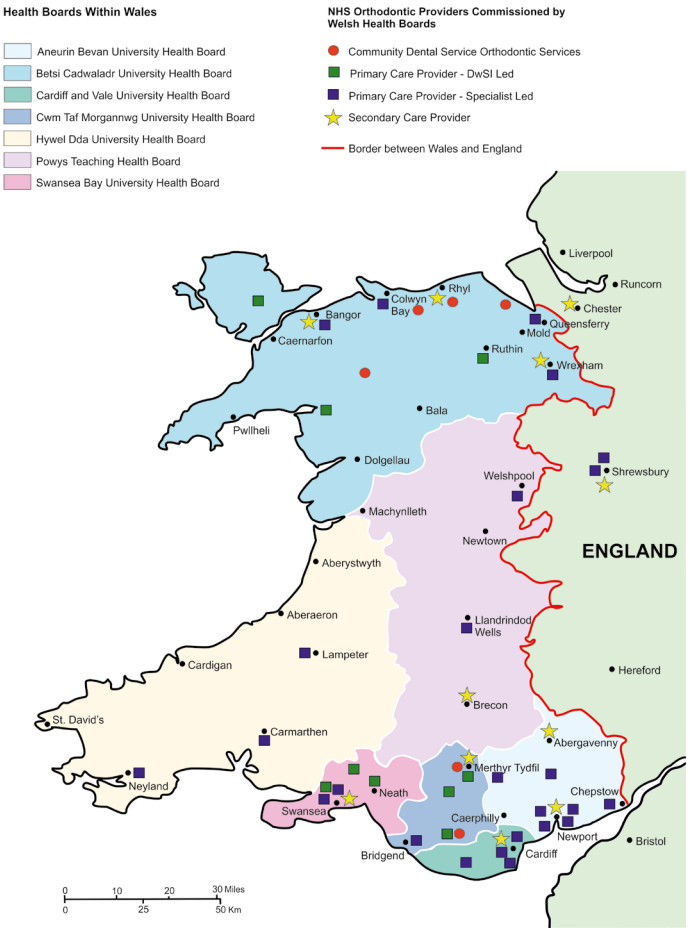

Fig. 1 Distribution of the NHS orthodontic providers commissioned by the Welsh health boards

Future work would be beneficial in helping to gain an appreciation of the working patterns of the workforce, anticipated time to ceasing orthodontic clinical activity and also general perceptions regarding their working life, as this would help identify potential risks to service provision and enable improved workforce planning. This would be best achieved with a direct survey of the orthodontic workforce within Wales.

Conclusions

1. The amount of NHS commissioned orthodontic activity within Wales is 76% of what is potentially required to meet the annual need as determined by the percentage of the 12-year-old population
2. Primary care orthodontic services are efficient, with 97.9% of commissioned activity being used to provide treatment
3. There are 112 clinicians who provide NHS orthodontic care within Wales: 52 specialists, 24 DwSI, 32 orthodontic therapists and four orthodontic trainees (StR1–3), providing 694.4 sessions of NHS orthodontic activity per week
4. In total, 30% of clinicians provide their NHS orthodontic care at multiple sites
5. NHS orthodontic care is provided at 47 sites within Wales: 32 sites in the general dental services or specialist practice, six sites within the community dental services, and nine in secondary care settings.

Author contributions

Benjamin R. K. Lewis: conceptualisation; methodology; investigation; data curation; writing – original draft; writing – review and editing; visualisation. Meryl E. Spencer, Sarah J. Merrett, Nasreen A. Yaqoob and Nizar A. Mhani: methodology; investigation; writing – review and editing.

Ethics declaration

This study was devised to calculate the volume of primary care orthodontic activity commissioned and comparing this to the 12-year-old population and ascertain the orthodontic workforce undertaking NHS orthodontic provision within Wales along with their distribution. The information gathered was via the use of publicly available information, freedom of information requests, liaising with primary care directors and contractor managers within Health Boards, along with the established orthodontic clinical networks within Wales. All received data was anonymised to ensure that it is non-identifiable, only summary data at an All Wales and Health

Board level is presented within this article. As such, the study did not require ethical approval as it was not considered research as per the Medical Research Council/NHS Health Research Authority assessment tool (hra-decisiontools.org.uk).

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