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Executive Summary

Introduction

1. This is the first review of the dental workforce since 1987. It covers dentists and professionals complementary to dentistry (PCDs) and has been undertaken at a time when major changes in the contractual and remuneration arrangements for the general dental services are in train. Team working in dentistry is also taking root as a result of extensions in the range of duties that dental therapists and dental hygienists may carry out; and as a result of the General Dental Council’s plans for the registration of other PCDs including dental technicians and dental nurses.

2. As the full implications of these changes for future dental workforce requirements are not yet clear, this review provides a best estimate of future demand and supply based on the data currently available. In order to keep these assumptions under review biennial update reviews will be undertaken.

3. The review concentrates on the primary care dental services. Hospital dentistry is not specifically included although it is recognised that the number of dental undergraduates is the main determinant of the supply of dentists not only to primary dental care, but also to hospital dental services and the dental care services provided in the community. This has been taken into account in the review’s findings.

4. Departmental reviews of the Senior House Officer grade and non-consultant career grades (covering both medicine and dentistry), the Salaried Primary Care Dental Services Review and a review which the Standing Dental Advisory Committee is undertaking of the dental specialties, will add further to our understanding of the workforce requirements of community and secondary dental care.

Methods of Working

5. The review has been carried out under the guidance of internal and external reference groups drawn from all the main stakeholders in dental care including:
   - the General Dental Council,
   - the British Dental Association,
   - the Faculties of Dental Surgery and General Dental Practice,
   - representatives of dental hospital deans and dental postgraduate deans,
   - the main representative bodies for the different classes of PCD,
   - the Association of Community Health Councils.

6. It is also informed by six workshops that were held on the themes of:
   - workforce planning,
   - consumer issues,
   - public health,
   - learning and personal professional development,
innovative ways of working, and
• recruitment and retention.

Workforce modelling

7. The Department of Health has carried out detailed modelling of demand and supply for the dental workforce in England. The review’s modelling team produced future projections of both demand and supply expressed in terms of ‘clinical time’ (i.e. direct contact time between a patient and a dental professional).

Demand

8. Adult and child demands were modelled separately based on population projections for the next 20 years. The following key factors were included:
• the impact of demographic and oral health trends,
• the proportion of the population who visit a dentist and trends in attendance, and
• the mix of treatments given to ‘average’ patients, and the time needed to provide them.

9. A crucial part of this work was the assessment of the treatment mix. This was based on advice from the Department’s scientific adviser on oral health and a group of practising dentists from various primary care settings convened by the BDA. Taking these findings into account two possible projections were modelled:
• a ‘higher’ demand projection which provides a baseline by representing a continuation of current work practices; and
• a ‘lower’ projection reflecting changing working practices.

10. Key outputs from the demand modelling were:
• the projections of adult demand suggest a slight increase between now and 2011, followed by a levelling-off between 2011 and 2021,
• the projection of child demand shows no significant change over the next 20 years.

11. Total demand at present is estimated at around 30 million clinical hours per year. The ‘higher’ projection suggested that this could rise to top 33 million hours in 2011 and would remain at that level to 2021. The ‘lower’ projection suggested that demand could increase to 31 million clinical hours by 2011, and return to just above current levels by 2021.

Supply

12. Supply models were based on registration data held by the GDC for dentists, dental therapists and hygienists. These are the three professions that can treat patients directly. Each of them contributes to the supply of ‘clinical time’. The dental technician and dental nurse workforces are not included in the current models.

13. The models used registration data (with age/sex/place of qualification breakdowns as needed) and reflected patterns of working hours, career breaks, and numbers of new entrants and retirements.
The following factors that have implications for the number of working dentists and the ‘whole-time equivalent’ workforce were also included:

- more demanding requirements for the registration of dentists from countries in the ‘Old Commonwealth’,
- a decrease in dentists’ working hours (often in combination with a switch from NHS to private dentistry),
- a ‘step change’ reduction in the time dentists spend on clinical work, resulting from specific pressures on clinical time (i.e. clinical governance, issues such as decontamination, clinical audit, etc.),
- the effect of women being a greater proportion of dental school graduates than previously,
- changing working patterns for both sexes.

14. To assess the gap between demand and supply the ‘baseline’ supply projections were run as projections of existing trends.

15. Key outputs from the ‘baseline’ supply modelling were that on current trends:

- the number of practising dentists in England is projected to fall by around 2,400 (WTE) between 2001 and 2021. However, the number of practising dental therapists is projected to increase by 870 (WTE) and the number of practising hygienists by 330 (WTE),
- the total supply of clinical time on a ‘dentist equivalent’ basis is estimated to be around 28.6 million hours in 2001 (approximately 27 million in 2003). This is projected to decline to 26.4 million hours by 2011 and 24.6 million hours by 2021.

### The Gap

16. The overall conclusion of the modelling work, with higher and lower projections made as at paragraph 9 are summarised in the following table.

<table>
<thead>
<tr>
<th>Year</th>
<th>Undersupply in hours (million)</th>
<th>Undersupply as WTE dentists</th>
<th>Undersupply as % of demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>1.5</td>
<td>1,050</td>
<td>5%</td>
</tr>
<tr>
<td>2003 (current)</td>
<td>2.7</td>
<td>1,850</td>
<td>9%</td>
</tr>
<tr>
<td>2011 (lower projection)</td>
<td>5.0</td>
<td>3,640</td>
<td>16%</td>
</tr>
<tr>
<td>2011 (higher projection)</td>
<td>7.1</td>
<td>5,100</td>
<td>21%</td>
</tr>
</tbody>
</table>
Section 1 – Introduction and Policy Context

Introduction

1.1. This is the first review of the primary care dental workforce in England since 1987. Since then, there have been significant changes in the provision of primary care dental services, and, perhaps more importantly when looking to future workforce needs, far-reaching reforms of NHS dental services are being planned that will deliver a new NHS dental service that is PCT led and responsive to local need. This new service will be able to focus on preventive measures to combat dental disease and address oral health inequalities.

1.2. In this review, which was established in July 2001 (terms of reference at Annex A), we have tried to identify the factors that impact on the shape and size of the workforce. The review has looked at the dental workforce (dentists and professionals complementary to dentistry (PCDs))\(^1\) required to deliver modern future services both within the NHS and in the private sector. In so doing so, it takes account of the balance between the NHS and private sector work, skill mix and remuneration systems, and the consequences for the skills required, training provision, recruitment and retention measures.

1.3. The review was carried out under the guidance of internal and external reference groups drawn from all the main stakeholders in dental care, including the General Dental Council (GDC), the British Dental Association, the Faculties of Dental Surgery and General Dental Practice, representatives of dental hospital deans, dental post graduate deans, the main representative bodies for the different classes of PCD and the Association of Community Health Councils. The External Reference Group (see Annex A for membership) was involved, for example, in considering the assumptions about factors which will impact on the demand for dental time, including the impact of technology. Detailed work was produced by six workshops on the themes of workforce planning, consumer issues, public health, learning and personal development, innovative ways of working, and recruitment and retention issues. Several hundred individuals gave their time to this process and summaries of their principal findings or conclusions, which have underpinned the work of this review, are at Annex C. We are indebted to everyone who participated in the course of the review.

1.4. Whilst the changes which are planned mean that it is difficult at present to draw on past experience when forecasting future dental workforce requirements, they make such an exercise imperative. Patients’ needs can only be met by the right numbers of staff, with the right skills, in the right place and at the right time. That implies regular dental workforce planning at all levels in the NHS. This report aims to provide a basis for such planning.

1.5. Hospital dentistry is not specifically included although it is recognised that the number of dental undergraduates is the main determinant of the supply of dentists to primary dental care, hospital dental services and the other secondary dental care services provided in the community. This has been taken into account in the review’s findings.

\(^1\) We have only been able to include dental therapists and hygienists in our modelling, but we have also taken account of the contribution of dental technicians and dental nurses.
1.6. Departmental reviews of the Senior House Officer grade and non-consultant career grades (covering both medicine and dentistry), the Salaried Primary Care Dental Services Review, and the Standing Dental Advisory Committee Review of the dental specialties will add further to our understanding of the workforce requirements of secondary dental care.

Policy context and direction

1.7. *Modernising NHS Dentistry – Implementing the NHS Plan* sets out how the Government would address problems of access to NHS dentistry and how it would tackle oral health issues and issues of quality. Since the publication of *Modernising NHS Dentistry – Implementing the NHS Plan*, the Government has been working increasingly closely with the dental profession and patient representative groups to identify the next steps necessary to modernise and reform NHS dentistry.

1.8. The general principles proposed for the new primary dental service were set out in the report *NHS Dentistry: Options for Change* produced by three task groups representing a wide range of dentists and other stakeholders under the leadership of the then Chief Dental Officer (Dame Margaret Seward) and published in August last year. One of the key recommendations of *Options for Change* was for local commissioning of a high quality dental service, responsive to the needs and wishes of patients and better able to address inequalities in oral health. The report also proposed that funding should be devolved to the local level to allow PCTs to secure the provision of a new service.

1.9. *The Health and Social Care (Community Health and Standards) Act* provides the legislative framework for taking Options for Change forward. PCTs will for the first time be given a duty to secure or provide primary dental services to the extent that they consider reasonable within their area. To meet their new responsibilities, they will assess local oral health needs. The intention is to move to local commissioning from April 2005.

1.10. A key aim of local commissioning is to provide a greater degree of operational control for the NHS locally, so that it can match planned services to the financial resources available. For general dental practitioners (GDPs) this would mean contracts for an agreed level of service over a fixed period of time, to be delivered to agreed quality standards. The Department of Health and the British Dental Association (BDA) are working with the NHS to develop a robust and simple contract – the base contract – which everyone can put in place from April 2005. The base contract will also provide a platform for PCTs and dentists who, by agreement, wish to go further and faster towards change. The intention is that contracts will be practice-based and related to the population the practice is proposing to serve rather than the current item of service based contract.

1.11. PCTs will also be able to secure the provision of services through personal dental services contracts or by providing services themselves through directly employed dental health care professionals.

1.12. The implications for workforce planning of these changes to NHS contractual and remuneration arrangements are considerable, but they are also complex. For example, even though one of the intentions of the changes is to create a NHS service that is more attractive to dentists, it is not clear to what extent there will be a change in the balance of primary care dentistry carried out in the private sector and the NHS. Nor is it entirely clear what the effect will be of a move away from an item of service based remuneration system. The existing system gives dentists an incentive to maximise the items of treatment provided in order to maintain income. Under an alternative system, it is possible that a more evidence-based approach to treatment may lead to less treatment being offered and to dentists

2 Department of Health 2000
3 Department of Health 2002
extending the time taken to provide individual items of treatment and preventive advice, in order to provide a more personal and higher quality service to patients.

1.13. Alongside these changes to contractual and remuneration arrangements, and likely to be encouraged by them, is the development of team working in dentistry. This can help to ensure that dentists spend more of their time working at the higher end of their skill level, rather than carrying on work that could be undertaken by PCDs, thus enabling more effective deployment of dentists’ specialist skills. Dentists would also be more frequently involved in exercising judgement over what work could be delegated, whilst retaining overall responsibility for the patient’s care. All this would have implications for workforce development and training.

1.14. Such team working is already taking root as a result of extensions to the range of duties dental therapists and dental hygienists may carry out, and as a result of the GDC’s plans for the registration of other PCDs including dental technicians and dental nurses. In July 2002 amendments to the Dental Auxiliary Regulations came into force, enabling dental therapists to work throughout dentistry. Work is under way to make the necessary changes to the Dentists Act to allow registration of PCDs and for extended duties to be undertaken. We expect the changes to commence in 2005.

1.15. These changes present considerable opportunities for the development of team based dentistry to enhance patient care but there remain uncertainties as to the pace and extent of change. The workforce impact will vary depending on a number of factors:

- What can be delegated by the dentist will affect the relative numbers of dentists and PCDs – although not in any simple sense because dentists will be freed to undertake more highly skilled and time consuming work,
- Working lives of PCDs may differ from those of dentists and there may be a relatively greater impact from the changing composition of the workforce,
- Increases in team based dentistry may require changes in practice size and organisation to allow them to best realise their potential – pace of change in this could affect the pace of progress to team based dentistry.

1.16. Whilst an increase in demand for PCDs is expected and should be planned for, developments in the organisation of practices and their capacity for accommodating additional members of the dental team will need to be kept under review.

1.17. This review provides a best estimate of future demand and supply based on the data currently available, but it will be clear from the context set out in this section that this estimate is likely to change with the passage of time as experience is gained of the effects of new NHS contractual and remuneration arrangements and of greater dental team working. Workforce planning will therefore need to be responsive to the situation as it develops. This issue is revisited later in this report.
Section 2 – Modelling Demand and Supply

General Approach

2.1. Workforce planning in dentistry was last addressed explicitly in England in 1987 by the Department of Health and Social Security. The 1987 review updated one carried out in 1983, also by the DHSS.

2.2. Annex B sets out the various approaches to workforce planning. The 1987 review used a mixture of methods. The current review builds on these methods allowing the Department time to develop a more sophisticated national workforce planning model.

2.3. Figure 1 sets out our general approach to modelling workforce demand and supply. The dashed lines indicate that more than one method is possible, as is explained in the next section. The demand for dentistry from children has been modelled differently from this general approach and is discussed below.

Figure 1 General approach to modelling workforce demand and supply

Modelling Dental Demand
The adult demand forecasts – strengths and weaknesses of different approaches

2.4. All steps in the stylised process outlined in Figure 1 involve projecting forward information by age-band. Like the 1983 and 1987 studies this part of the review relies heavily on the Adult Dental Health Surveys (ADHS), of which the latest was held in 1998. The ADHS has been used since it covers all sectors of dentistry for adults including the private sector. General Dental Service (GDS) data, although very detailed, only covers NHS treatment and is therefore partial.

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4 The Scottish Executive published an interim report on workforce planning in dentistry in Scotland in September 2000 (Scottish Executive 2000) and reviews have also been carried out in Wales and Northern Ireland.
6 Dental manpower. Department of Health and Social Security 1983
2.5. Population projections from the Government Actuary’s Department (GAD) are the starting point for the model.

2.6. The next stage is to sort the population into the dentate and edentate groups (people with some teeth and people with no teeth) since people with no teeth (dentulism) make much less use of dental services, their needs being largely limited to the repair and replacement of dentures and periodic reviews of their oral health. The next step is a crucial one, how to translate numbers of dentate and edentate people into treatment demand.

2.7. The 1983 and 1987 reviews used attendance rates of regular and occasional attenders as the basis of assessing demand. Our first approach used a similar method – although we have revised it to take account of additional information. This is the ‘attendance’ approach (the upper lines in Figure 1).

2.8. However, dental attendance is a rather blunt instrument and tells us little about important issues that will affect workforce planning. For example, people with different levels of decay will require different types and lengths of treatment and therefore different amounts of time from dentists, or other staff. Projections of demand and supply based on dental attendance alone may therefore be misleading.

2.9. We have therefore also used an alternative approach, the ‘treatment hours’ approach (the lower lines in Figure 1). This uses our best estimate – in conjunction with our scientific adviser and a group of practitioners convened by the BDA – of what proportion of the population’s teeth will be in different states of dental health and what average time will be needed to treat them at various points in the future. This results in numbers of ‘treatment hours’ required.

2.10. Both approaches have strengths and weaknesses. (Figure 2).

**Figure 2 Main strengths and weaknesses of alternative demand approaches**

<table>
<thead>
<tr>
<th>Approach</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance</td>
<td>• Consistent with previous dental reviews</td>
<td>• Takes no account of changes in the productivity of dentists or dental teams</td>
</tr>
<tr>
<td></td>
<td>• Data on past trends available</td>
<td>• Attendances are self-reported and may not be accurate</td>
</tr>
<tr>
<td></td>
<td>• Based on recorded trends of treatment demanded</td>
<td>• Current case mix (and therefore attendance rate) is unlikely to persist given changes in oral health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Complex interactions may not be taken into account</td>
</tr>
<tr>
<td>Treatment hours</td>
<td>• Does take account of changes in the productivity of dentists or dental teams</td>
<td>• Not consistent with previous dental reviews</td>
</tr>
<tr>
<td></td>
<td>• Based on experts’ estimates of ‘need’ for treatment?</td>
<td>• Data on likely trends more speculative</td>
</tr>
<tr>
<td></td>
<td>• Takes into account the effect of changes in oral health on the type of treatment required and hence the length of time required for treatment</td>
<td>• Experts views of treatment required may be awry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Complex interactions may not be taken into account</td>
</tr>
</tbody>
</table>

2.11. The attendance approach concentrates on historical trends in actual demand. If current trends continue this is likely to be reasonably accurate. However, apart from the issue that the attendances are *reported* rather than recorded, improvements in oral health are likely to lead to attendances of shorter duration in the future. The attendance approach may therefore overestimate the demand for dental care.
2.12. The treatment hours approach is based on experts’ views of what is likely to be needed and demanded in the future. These have the advantage of insight and are based on projections of oral health status. Nevertheless, an element of speculation remains.

2.13. Results from both approaches are presented in this section. It should be noted that neither approach can take into account detailed interactions arising, for example, from the fact that supply and demand are not entirely independent. This would require the development of a more detailed model.

Key factors when building the adult demand estimates

2.14. There are several key factors that need to be taken into account when building the demand estimates. These include:

- **The impact of demography and trends in oral health.** The age-profile of the population is changing through time with a boost to the older generations expected in the next 10 to 20 years and a fall in the numbers of younger people. This will have impacts on demand at both ends of the age-scale. Broadly, demand from the elderly will increase as the growing elderly sector both retain their teeth and have higher expectations of dental services, simultaneously demand from the younger sector will decline (as there are fewer young people and they have better health, the ‘no-decay’ generation),

- **Factors that impact on the demand for dental time.** An array of factors will impact on dental time in the future. A major factor is the likely change to the recommended check-up frequency. Currently the general public is advised by the dental profession to attend their dentist every 6 months. The present GDS remuneration system also encourages six-monthly examinations. A reduction in this frequency would result in lower demand and fewer attendances. An important countervailing factor is dental consumerism (i.e. increasing consumer demands for cosmetic dentistry),

- **The impact of technology.** For example, if caries vaccination is successful and is diffused rapidly the demand for dentistry will change. This could be complex, for example with increasing demand in the short-term (for vaccination), followed by reducing demand in the long-term. This is particularly pertinent to the treatment hours approach.

2.15. It is possible to predict the impact of demographic change with a degree of confidence, but the impact of the other factors is less certain. The demand estimates in this report are based on baseline assumptions that were considered by the External Reference Group.

Adult dental attendance approach

2.16. The starting point for the projections is the 1998 ADHS data. This provides rich data on both dental attendance rates and attitudes to dental attendance. Dentate adults (over 16s) were asked to categorise themselves as ‘regular attenders’, ‘occasional attenders’ or those ‘attending only for trouble’. The survey also asked how many times in the last five years that they had visited the dentist. This data allowed figures on the average dental attendance rate by age group and type of attendee to be produced. Table 1 shows that frequency of attendance differs by attitude but less so according to age, although attendance does dip at 75 and above. This could be related to edentulism and/or disability affecting access to care.
Table 1 Average reported attendance rates per annum for dentate adults 1993–98

<table>
<thead>
<tr>
<th>Age-band</th>
<th>Regular</th>
<th>Occasional</th>
<th>Trouble</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>16–24</td>
<td>2.14</td>
<td>1.37</td>
<td>0.69</td>
<td>1.51</td>
</tr>
<tr>
<td>25–34</td>
<td>2.05</td>
<td>1.21</td>
<td>0.63</td>
<td>1.49</td>
</tr>
<tr>
<td>35–44</td>
<td>2.19</td>
<td>1.06</td>
<td>0.55</td>
<td>1.64</td>
</tr>
<tr>
<td>45–54</td>
<td>2.28</td>
<td>1.06</td>
<td>0.52</td>
<td>1.71</td>
</tr>
<tr>
<td>55–64</td>
<td>2.22</td>
<td>1.25</td>
<td>0.39</td>
<td>1.69</td>
</tr>
<tr>
<td>65–74</td>
<td>2.15</td>
<td>1.18</td>
<td>0.35</td>
<td>1.63</td>
</tr>
<tr>
<td>75+</td>
<td>2.17</td>
<td>0.87</td>
<td>0.29</td>
<td>1.41</td>
</tr>
<tr>
<td>Total</td>
<td>2.17</td>
<td>1.17</td>
<td>0.54</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Source: Analysis of ADHS data set 1998

2.17. The ADHS attendance data represent self-reported visits to dentists, and suggest that a total of 24.4 million adults visit any dentist in a year. Estimates derived from GDS registration data suggest that around 15.7 million adults visit a GDS dentist in a year. This leaves a sizeable shortfall (between 8.5 million and 9 million patients – around 35% of all who report attending in a given year) to be made up by patients seen by the private sector, Community Dental Service and Hospital Dental Service. Estimates from other sources suggest that these sectors of dentistry treat a smaller proportion of patients than this. This suggests that the ADHS data may overestimate actual dental attendance by reflecting a mixture of inaccurate recall and aspirations to visit. The overall extent of this is not clear and is difficult to assess.

2.18. Ideally, we would like to know the trends in attendance frequency by type of attender to forecast into the future. Unfortunately, the frequency question was not asked in previous surveys. However, previous surveys do show a clear trend over time towards a greater proportion of dentate adults attending ‘regularly’ and a smaller proportion attending ‘only for trouble’. The trend intensifies the older the age group concerned. (59% of dental patients attended regularly for a check-up in 1998 which is up from 43% in 1978 and 40% in 1988. This trend is reflected in the fall in the percentage attending only when there is trouble has fallen from 43% in 1978 to 36% in 1988 and 30% in 1998)

2.19. Table 2 shows forecast numbers of dental attendances based on projecting average attendance rates in 1998 forward and assuming that the trend towards more regular visiting will continue. It also takes into account the impact of demographic projections and expected reductions in edentulousness.

Table 2 Forecast numbers of dental attendances demanded for adults in England (‘000s)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>16–24</td>
<td>8,091</td>
<td>13%</td>
<td>−4%</td>
</tr>
<tr>
<td>25–34</td>
<td>11,524</td>
<td>−15%</td>
<td>12%</td>
</tr>
<tr>
<td>35–44</td>
<td>11,539</td>
<td>22%</td>
<td>−11%</td>
</tr>
<tr>
<td>45–54</td>
<td>10,433</td>
<td>26%</td>
<td>21%</td>
</tr>
<tr>
<td>55+</td>
<td>12,998</td>
<td>56%</td>
<td>46%</td>
</tr>
<tr>
<td>Total</td>
<td>54,585</td>
<td>22%</td>
<td>17%</td>
</tr>
</tbody>
</table>

There are currently about 26.5 million courses of treatment for patients over 19 in the English GDS per year, about 0.75 courses per dentate adult
2.20. Attendance rates are projected to increase by approximately 40% between 1998 to 2018. The projected increase is most marked in the oldest groups, driven by large increases in the proportion in older age groups who visit the dentist regularly, leading to a pattern where dental attendance increases with age. This reverses the pattern of the past where 20 or so years ago dental attendance declined with age.

**Key demand point 1:**
The attendance approach baseline estimate suggests adult dental attendance will increase by 40% between 1998 and 2018

### Adult treatment hours approach

2.21. The treatment hours approach estimates dental demand in terms of the time required to meet the oral health needs of those patients who attend. As noted above, important factors in any time-based demand model include the condition that patients’ mouths are in, and a view of the resulting treatment provision and the time required to carry out this treatment.

2.22. A model of adult dental demand on clinical time was built around the following questions:

- **Population and general demographic changes.** How many adults will there be in the period we are modelling? What will the age profile of the population be?
- **Projected change in the size of the edentulous population.** Given the projected changes to the population, how many people with no teeth will there be?
- **Projected changes in the oral health of the dentate population.** How do we assess oral health within the dentate population? What are the prevailing trends in oral health, and how will they develop in the future?
- **Information on attendance patterns.** In any given year, what proportion of the population will visit a dentist? How does this vary by age and / or oral health?
- **An assessment of the dental treatments that patients receive.** What treatments do ‘average’ adult patients who visit their dentist receive at present? How frequently are the various treatments provided? How do these treatment programmes vary according to a patient’s age and oral health? What is this likely to be in the future?
- **A measure of the time taken to carry out dental treatments.** How long does it currently take to provide the various treatment items that ‘average’ patients receive? How will these timings change in the future, allowing for the effects of possible legislative changes and technological developments?

2.23. Demographic change was the simplest to take into account. Population projections by age group were taken from the Government Actuary’s Department.

2.24. For oral health, the ADHS 1998 data was taken as the baseline. Projections on the proportion of the population by age band in three categories of oral health defined as ‘no teeth’, ‘healthier – low treatment need’ and ‘less healthy – high treatment need’\(^8\) were then made.

2.25. Figure 3 shows the projections of the numbers of adults in these categories in 2001 and 2021, obtained by applying population projections for these years to the ADHS forecasts for 1998 and 2018, respectively.\(^9\)

---

\(^8\) Where ‘no teeth’ implies edentate, ‘healthier – low treatment need’ implies those with 18 or more sound and untreated teeth and ‘less healthy – high treatment need’ implies those with 14 or more teeth that are not sound.

\(^9\) This three-year shift was to enable comparison between the demand estimates and the projections of supply, which use 2001 workforce data as their basis. While there may have been minor changes to oral health between 1998 and 2001, we felt that the overall trends are correct and any inaccuracy will be relatively minor.
2.26. Information on attendance rates was taken from the ADHS, as under the dental attendance approach. As noted above, this may overstate attendance rates to some degree.

2.27. In order to estimate the programmes of treatment that might be given to an ‘average’ adult who attends a dentist in each of the three health categories above, we consulted members of the dental profession. A group of eight practising dentists working in a cross-section of primary care settings and our scientific adviser, Professor Elizabeth Treasure, met at the British Dental Association on 31 July 2002 under the chairmanship of Dr Anthony Kravitz. The meeting discussed and agreed the ‘average’ patients’ treatment programmes and the time required to deliver them, both at present and in the future.

Figure 3 Baseline projections of adults in different dental health categories

2.28. They developed two scenarios for the types and frequencies of treatments that the ‘average’ adult in the dental states described above requires. One scenario was based on assumptions that recall intervals would decrease for the healthy and that there would be a relatively quick shift in treatments towards less time-intensive dentistry combined with relatively conservative assumptions about the additional time spent with private patients – this is the ‘lower’ estimate.
The other scenario was based on slightly less optimistic judgements about the development of treatments, with relatively more treatment time spent on the ‘healthy’ groups, and less evolution in treatments coupled with an assumption that appointment times with private patients are higher – this is the ‘higher’ estimate. NB: there is no lower estimate for 2001 as this estimate assumes a future change in treatment patterns.

2.29. Having included data on population, oral health and attendance (as detailed above) as well as the treatment programmes and timing assessments from the dentists’ meeting of 31 July 2002, we produced projections of adults’ demand for dental time based on the two scenarios. The results are set out in table 3.

Table 3 Forecast numbers of annual ‘treatment hours’ demanded for adults in England (‘000)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>18–24</td>
<td>2,254</td>
<td>14%</td>
<td>14%</td>
<td>–9%</td>
<td>–9%</td>
<td>–9%</td>
<td>–9%</td>
<td>–9%</td>
</tr>
<tr>
<td>25–34</td>
<td>4,640</td>
<td>–19%</td>
<td>–14%</td>
<td>3%</td>
<td>5%</td>
<td>3%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>35–44</td>
<td>6,291</td>
<td>–26%</td>
<td>–18%</td>
<td>–22%</td>
<td>–16%</td>
<td>–22%</td>
<td>–16%</td>
<td>–16%</td>
</tr>
<tr>
<td>45–54</td>
<td>5,991</td>
<td>4%</td>
<td>7%</td>
<td>–29%</td>
<td>–21%</td>
<td>–29%</td>
<td>–21%</td>
<td>–21%</td>
</tr>
<tr>
<td>55–64</td>
<td>4,379</td>
<td>31%</td>
<td>31%</td>
<td>–2%</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>65–74</td>
<td>2,813</td>
<td>31%</td>
<td>32%</td>
<td>30%</td>
<td>31%</td>
<td>30%</td>
<td>31%</td>
<td>31%</td>
</tr>
<tr>
<td>75–84</td>
<td>1,271</td>
<td>32%</td>
<td>32%</td>
<td>43%</td>
<td>42%</td>
<td>43%</td>
<td>42%</td>
<td>42%</td>
</tr>
<tr>
<td>85+</td>
<td>151</td>
<td>150%</td>
<td>143%</td>
<td>51%</td>
<td>50%</td>
<td>51%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Total</td>
<td>27,789</td>
<td>5%</td>
<td>7%</td>
<td>–3%</td>
<td>0.1%</td>
<td>–3%</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

2.30. As can be seen, whilst the overall impact is relatively modest, there are significant variations in treatment time in different age groups. The elderly and, in particular very elderly populations will require a large relative increase in treatment, because they will have more teeth, whilst the younger and middle-aged groups seeing steep absolute falls, because they will have healthier teeth.

**Key demand point 2:**

On the lower ‘baseline’ estimate, projections of adult treatment hours demanded imply a small overall growth in demand to 2011 (+5%) and a small decrease in the next 10 years (–3%). On the higher estimate, projections imply a larger growth over 2001–11 (+7%) and very little growth from 2011–21 (+0.1%).

Reconciling the implications for adult demand from the attendance and treatment hours approaches

2.31. The two approaches to demand result in seemingly irreconcilable results. However, rising attendance and a more moderate increase in overall treatment time are not inconsistent. The attendance projections take into account the increasing willingness of the population to see their dentist more regularly. The treatment hours projections take into account shifts in expected treatment philosophies and the need for shorter consultations for more and more people as dental health continues to improve for the majority of the population. Although attendances are projected to rise, on average they will take less time. We believe in the future most patients will have fewer and quicker treatments, whilst small numbers of patients will have more complex treatments, particularly as they get older.
2.32. The attendance projections are weaker as a basis for forecasting demand for two reasons

- they assume attendance rates by type of attender will remain at 1998 levels (ignoring the likely shift to a longer treatment interval);
- they ignore the likely impact of better oral health in reducing the length of attendance.

2.33. These flaws point to a possible over-estimate of demand.

2.34. On balance, we therefore attach more weight to the results from the treatment hours projections than from the attendance approach.

**Key demand point 3:**

On balance, we attach more weight to the results from the adult treatment hours projections than from the adult attendance approach.

**Children’s demand for dentistry**

2.35. The estimates of demand for dentistry from children make use of information about GDS treatment from the Dental Practice Board, and a survey of dentists’ workload carried out by the Office for Manpower Economics (OME). We have used this approach on the premise that GDS activity is likely to be representative of all treatment provided to children, since all children are eligible to receive free NHS dental treatment.

2.36. Demand for children was split into non-orthodontics and orthodontics since the latter is an important evolving treatment – both expensive and time-consuming – where demand pressures are particularly strong.

2.37. For the non-orthodontic treatment, registration rates (plus estimates of PDS and CDS activity) were used along with estimates from the OME survey of the time taken to treat child GDS patients to derive average times spent per patient in different age groups. These were multiplied by population estimates. For orthodontic patients, age-treatment profiles were taken from GDS data along with an assumed average treatment time per patient, spread over 2 years. This profile of orthodontic time by patient age was again indexed by projected population.

2.38. Baseline estimates forecast approximately 3.79m treatment hours with children in 2001 (approx. 15% orthodontics) accounting for around 3% of total demand. Figure 4 shows that, whilst the number of children is projected to fall, demand from children is likely to remain broadly unchanged in the first two decades of this century (index = 1 in 2001) based on an assumed growth in the proportion of children treated (0.5% p.a.) and a rise in the orthodontic caseload (1.0% p.a.).
2.39. An important factor in the projections of demand remaining broadly flat (even though treatment rates are assumed to increase) is the expected change in the age profile of the child population. As figure 5 shows, the projected decrease in the child population between 2001 and 2025 will mostly occur in the older (and more dentally demanding) age bands. This demographic change serves to compensate for modelling assumptions that a greater proportion of children will be treated and more orthodontic work will be carried out.

Figure 5: Projected child population by age band: England 2001 and 2025

2.40. It should be noted that the model does not assume any future changes in children’s oral health. If there were improvements in this area, we might expect the average time spent per treated patient (on non-orthodontic work) to decrease, which would lead to a reduction in the projected dental demand from child patients. However, child patients only account for around one-eighth of dentists’ time; as a result, even major changes to child demand will only have a small effect on the overall dental demand projections.
**Key demand point 4:**
Demand for dentistry from children is likely to remain broadly unchanged in the first two decades of the 21st century.

**The total demand for dentistry**

2.41. Combining the separate ‘treatment hours’ projections of adult and child demand gives an estimate of the total demand for dental services over the next 20 years.

2.42. Total demand at present is estimated at around 30 million clinical hours per year. The conclusion from our higher, ‘baseline’, projection is that demand could rise to top 33 million hours in 2011 and would remain at that level to 2021. The lower projection, reflecting changing working practices, suggests that demand could increase to around 31 million clinical hours by 2011, and return to just above current levels by 2021. However, beneath this level trend there is likely to be considerable change in the type of treatment required as oral health change feeds through the population.

2.43. The following graph illustrates the higher ‘baseline’ and lower ‘changing practices’ demand projections. Note that the latter projection is shown as a dashed line between 2001 and 2006. This is because the treatment assumptions used in this projection reflect how the provision of treatment might develop, rather than the treatment being provided currently. Consequently, it does not truly reflect present demand.

**Figure 6: The demand for dentistry – lower and higher scenarios**

**Key demand point 5:**
The overall demand for dentistry is likely to rise slightly between now and the beginning of the next decade. This rise will be somewhat faster in the higher scenario. There will be slower growth over the next 10 years with a slight decline in the lower scenario.
Supply

2.44. A series of models have been built to project the supply of the dental workforce in the light of existing trends and to explore the effect of likely major factors in coming years. So far the models concentrate on the 'core team', dentists, therapists and hygienists delivering dentistry to the patient. For dentists, the model is based on the numbers of dentists on the GDC register, broken down by age, gender and whether UK or non-UK qualified.

2.45. Separate models have been constructed to project the therapist and hygienist workforces. These are also based on GDC register data. They track changes to the workforce on an annual basis, and make allowance for a degree of overlap between the therapist and hygienist registers.

2.46. Since the models for all professions are based on the GDC registers, they produce projections covering the whole of the UK. However, the figures presented in this report (unless stated otherwise) have been adjusted to estimate the supply of dentistry in England only.

2.47. The information necessary to create similar models for dental technicians and dental nurses is not at present available, since there are not as yet registers for these professions.

Dentists

2.48. We have made two projections for the supply of dentists

- A ‘steady state’ scenario
- A ‘baseline’ scenario, which represents our best estimate of how the supply of dentists will evolve in the future

'Steady State' scenario

2.49. This projection assumes that the main flows and patterns in the workforce will continue unchanged from those seen in the last few years. Hence:

- No change in part-time working or career breaks,
- No change in early retirement,
- No change in the proportion of registered dentists who are practising in the UK (for example the numbers qualifying from UK dental schools who practise elsewhere in the EU remain the same),
- Number, age and gender profile of UK dental school graduates continue as at present,
- Dentists’ productivity (i.e. proportion of their time spent doing clinical work) does not change,
- Dentists engaged in Maxillo facial work are excluded from the practicing rate as this is not reflected in the demand projection.

2.50. The model assumes one major change in pattern compared with that of recent years – that the number of non-UK qualified dentists on the register will fall from 15% in 2001 to 11% in 2031. This is not, however, the main cause of the changes to the headcount shown in Table 4 which largely result from past changes in the number of dental graduates.

2.51. Furthermore, whilst not a sudden change, the model shows the effects of the percentage of registered dentists who are female rising from 31% in 2001 to 45% in 2031. As this effect works through the model there is an impact on the numbers working and on the whole-time equivalent (WTE) workforce.
2.52. In translating the numbers of dentists on the register to a practising whole time equivalent (WTE) workforce of practising clinical dentists in England and in calculating the supply of clinical time, we have assumed a whole-time working week of 42.5 hours and a 46-week working year. We have also incorporated results from the Office of Manpower Economics (OME) survey of GDS dentists to estimate the amount of time dentists spend per week on clinical work.

2.53. The projected supply of dentists between 2001 and 2031 under these assumptions is shown in table 4.

<table>
<thead>
<tr>
<th>Year</th>
<th>GDC Register headcount</th>
<th>Practising WTE dentist workforce</th>
<th>Supply of clinical time (x 1m hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>27,140</td>
<td>18,820</td>
<td>27.44</td>
</tr>
<tr>
<td>2006</td>
<td>27,360</td>
<td>18,740</td>
<td>27.33</td>
</tr>
<tr>
<td>2011</td>
<td>27,110</td>
<td>18,270</td>
<td>26.65</td>
</tr>
<tr>
<td>2016</td>
<td>26,590</td>
<td>17,620</td>
<td>25.69</td>
</tr>
<tr>
<td>2021</td>
<td>26,020</td>
<td>17,020</td>
<td>24.82</td>
</tr>
<tr>
<td>2026</td>
<td>25,560</td>
<td>16,600</td>
<td>24.21</td>
</tr>
<tr>
<td>2031</td>
<td>25,310</td>
<td>16,370</td>
<td>23.87</td>
</tr>
</tbody>
</table>

2.54. The 'steady state' scenario projects the dental workforce under the assumption that current flows and patterns will continue. However, there are some significant factors that are likely to affect the workforce in the future but which are not apparent in existing data.

2.55. The following factors have been incorporated into the model to obtain a 'baseline' (i.e. most likely) projection. This represents our best estimate of how the supply of dentists will evolve in the future; assuming that there will be no further interventions to alter supply:

- Decreasing trend in the working hours of dentists. This reflects an emerging pattern, particularly for male dentists, of dentists cutting back their average 'whole-time' hours (often in combination with a shift from NHS to Private working),

- 'Step change' reduction in the proportion of dentists' effective time spent on clinical work. This reflects the increased non-clinical demands on dentists (tighter cross-infection controls, compulsory CPD) that have been introduced recently and which will have an effect on working practices in the coming few years.

2.56. The projected supply of dentists after incorporating these factors is shown in the following table.

<table>
<thead>
<tr>
<th>Year</th>
<th>GDC Register headcount</th>
<th>Practising WTE dentist workforce</th>
<th>Supply of clinical time (x 1m hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>27,140</td>
<td>18,820</td>
<td>27.44</td>
</tr>
<tr>
<td>2006</td>
<td>27,360</td>
<td>18,570</td>
<td>27.33</td>
</tr>
<tr>
<td>2011</td>
<td>27,110</td>
<td>17,940</td>
<td>26.65</td>
</tr>
<tr>
<td>2016</td>
<td>26,590</td>
<td>17,140</td>
<td>25.69</td>
</tr>
<tr>
<td>2021</td>
<td>26,020</td>
<td>16,140</td>
<td>24.82</td>
</tr>
<tr>
<td>2026</td>
<td>25,560</td>
<td>15,860</td>
<td>24.21</td>
</tr>
<tr>
<td>2031</td>
<td>25,310</td>
<td>15,500</td>
<td>23.87</td>
</tr>
</tbody>
</table>

2.57. The incorporation of these factors has not affected the projected register headcount. However, by 2031 they reduce the projected WTE workforce by 900 dentists and the supply of clinical time by 2.5 million hours. These differences are illustrated in the following graphs.
2.58. The following table shows the projected supply of dental hygienists and dental therapists between 2001 and 2031. It assumes that existing patterns of training, working hours and career paths will continue, although the clinical productivity of hygienists and therapists (i.e. supply of clinical time) is assumed to decrease as for dentists in the ‘baseline’ scenario. The assumptions used to estimate the WTE workforce and the supply of clinical time are the same as those used for dentists. 150 additional training places for therapists are included from 2005 onwards.
Table 6 Projected Supply of Dental Hygienists and Dental Therapists

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2006</th>
<th>2011</th>
<th>2016</th>
<th>2021</th>
<th>2026</th>
<th>2031</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hygienists</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDC Register headcount</td>
<td>3,363</td>
<td>3,630</td>
<td>3,819</td>
<td>3,922</td>
<td>3,954</td>
<td>3,932</td>
<td>3,887</td>
</tr>
<tr>
<td>Practising WTE workforce</td>
<td>1,826</td>
<td>1,983</td>
<td>2,097</td>
<td>2,153</td>
<td>2,159</td>
<td>2,133</td>
<td>2,099</td>
</tr>
<tr>
<td>Supply of clinical time (x 1m hrs)</td>
<td>2.91</td>
<td>3.00</td>
<td>3.17</td>
<td>3.26</td>
<td>3.27</td>
<td>3.23</td>
<td>3.18</td>
</tr>
<tr>
<td><strong>Therapists</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDC Register headcount</td>
<td>378</td>
<td>577</td>
<td>1141</td>
<td>1601</td>
<td>2030</td>
<td>2427</td>
<td>2768</td>
</tr>
<tr>
<td>Practising WTE workforce</td>
<td>180</td>
<td>304</td>
<td>604</td>
<td>831</td>
<td>1049</td>
<td>1259</td>
<td>1445</td>
</tr>
<tr>
<td>Supply of clinical time (x 1m hrs)</td>
<td>0.29</td>
<td>0.46</td>
<td>0.91</td>
<td>1.26</td>
<td>1.59</td>
<td>1.91</td>
<td>2.19</td>
</tr>
</tbody>
</table>

2.59. These projections are for the future supply of hygienists and therapists. However, they do not reflect PCDs’ lower level of clinical productivity compared with that of dentists, nor the fact that a PCD is typically working in conjunction with a dentist.

2.60. We have obtained estimates (from a systematic review and synthesis of published studies carried out by Dr John Galloway) that a dental therapist working with a single-handed dentist increases the dentist’s output by 46% (compared to his/her output as a stand-alone practitioner). In similar circumstances, a dental hygienist increases a dentist’s output by an estimated 33%. If we assume that all therapists and hygienists are deployed in this fashion we can convert the above projections of the WTE workforce and the supply of clinical time to their ‘dentist equivalent’ levels. (In other words, the number of WTE dentists and the amount of dentists’ clinical time that is ‘equivalent’ to the PCD workforce and its clinical output.)

2.61. However, only a small number of the studies used in Dr Galloway’s review were carried out in the UK, with many carried out in the entirely different dental environment in the United States. As he points out, a proportion are also significantly out of date with nearly half being published before 1980. Informed opinion suggests that the review’s calculations of a PCD’s productivity (relative to that of a dentist) may underestimate their contribution in the current dental landscape. Although we have not attempted to revise the productivity estimates, this should be borne in mind during the following discussion.

2.62. The ‘dentist equivalent’ PCD workforce projections are shown in the following table.

Table 7 ‘Dentist Equivalent’ PCD Workforce Projections

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2006</th>
<th>2011</th>
<th>2016</th>
<th>2021</th>
<th>2026</th>
<th>2031</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hygienists – dentist equivalent</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practising WTE workforce</td>
<td>639</td>
<td>694</td>
<td>734</td>
<td>754</td>
<td>755</td>
<td>746</td>
<td>735</td>
</tr>
<tr>
<td>Supply of clinical time (x 1m hrs)</td>
<td>1.02</td>
<td>1.05</td>
<td>1.11</td>
<td>1.14</td>
<td>1.14</td>
<td>1.13</td>
<td>1.11</td>
</tr>
<tr>
<td><strong>Therapists – dentist equivalent</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practising WTE workforce</td>
<td>83</td>
<td>140</td>
<td>278</td>
<td>382</td>
<td>483</td>
<td>579</td>
<td>665</td>
</tr>
<tr>
<td>Supply of clinical time (x 1m hrs)</td>
<td>0.13</td>
<td>0.21</td>
<td>0.42</td>
<td>0.58</td>
<td>0.73</td>
<td>0.88</td>
<td>1.01</td>
</tr>
</tbody>
</table>
The ‘Core Dental Team’

2.63. We can now combine the supply projections for dentists and PCDs to give projections of the supply of dentistry for the core dental team. The following table shows the unadjusted projections of total supply under the ‘baseline’ assumptions, and the proportions of the totals accounted for by PCDs.

Table 8 Unadjusted Projections of Total Supply

<table>
<thead>
<tr>
<th>Core dental team – unadjusted</th>
<th>2001</th>
<th>2006</th>
<th>2011</th>
<th>2016</th>
<th>2021</th>
<th>2026</th>
<th>2031</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total staff headcount</td>
<td>30,879</td>
<td>31,565</td>
<td>32,068</td>
<td>32,111</td>
<td>32,001</td>
<td>31,923</td>
<td>31,961</td>
</tr>
<tr>
<td>%PCDs</td>
<td>12.1%</td>
<td>13.3%</td>
<td>15.5%</td>
<td>17.2%</td>
<td>18.7%</td>
<td>19.9%</td>
<td>20.8%</td>
</tr>
<tr>
<td>Total staff WTE workforce</td>
<td>20,821</td>
<td>20,856</td>
<td>20,843</td>
<td>20,124</td>
<td>19,621</td>
<td>19,254</td>
<td>19,044</td>
</tr>
<tr>
<td>%PCDs</td>
<td>9.6%</td>
<td>11.0%</td>
<td>13.1%</td>
<td>14.8%</td>
<td>16.3%</td>
<td>17.6%</td>
<td>18.6%</td>
</tr>
<tr>
<td>Total supply of clinical time</td>
<td>30.63</td>
<td>29.18</td>
<td>28.26</td>
<td>28.41</td>
<td>27.59</td>
<td>27.11</td>
<td>26.84</td>
</tr>
<tr>
<td>%PCDs</td>
<td>10.4%</td>
<td>11.9%</td>
<td>14.1%</td>
<td>16.0%</td>
<td>17.6%</td>
<td>18.9%</td>
<td>20.0%</td>
</tr>
</tbody>
</table>

2.64. The following table shows the projections for the total WTE workforce and the total supply of clinical time, with the therapists’ and hygienists’ contributions adjusted to ‘dentist equivalent’.

Table 9 Projections of Total Supply Adjusted to ‘Dentist Equivalent’

<table>
<thead>
<tr>
<th>Core dental team – ‘dentist equivalent’</th>
<th>2001</th>
<th>2006</th>
<th>2011</th>
<th>2016</th>
<th>2021</th>
<th>2026</th>
<th>2031</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total staff WTE workforce</td>
<td>19,537</td>
<td>19,402</td>
<td>18,953</td>
<td>18,276</td>
<td>17,651</td>
<td>17,188</td>
<td>16,899</td>
</tr>
<tr>
<td>Total supply of clinical time (x 1 m hrs)</td>
<td>28.59</td>
<td>26.98</td>
<td>26.39</td>
<td>25.46</td>
<td>24.61</td>
<td>23.98</td>
<td>23.59</td>
</tr>
</tbody>
</table>

Gap Analysis

2.65. The following graph compares the baseline projection of demand for dental time with the above baseline projection of supply (on a ‘dentist equivalent’ basis). Of course, all these estimates are based on informed clinical opinion and will need to be kept under review.

Figure 9: Projected demand and supply for dentistry in England 2001–36
<table>
<thead>
<tr>
<th></th>
<th>Undersupply in hours (million)</th>
<th>Undersupply as WTE dentists</th>
<th>Undersupply as % of demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>1.5</td>
<td>1,050</td>
<td>5%</td>
</tr>
<tr>
<td>2003 (current)</td>
<td>2.7</td>
<td>1,850</td>
<td>9%</td>
</tr>
<tr>
<td>2011 (lower projection)</td>
<td>5.0</td>
<td>3,640</td>
<td>16%</td>
</tr>
<tr>
<td>2011 (higher projection)</td>
<td>7.1</td>
<td>5,100</td>
<td>21%</td>
</tr>
<tr>
<td>2021 (lower projection)</td>
<td>6.1</td>
<td>4,434</td>
<td>20%</td>
</tr>
<tr>
<td>2021 (higher projection)</td>
<td>9.0</td>
<td>6,484</td>
<td>27%</td>
</tr>
</tbody>
</table>

2.66. The assessment of the current situation is that there is an under supply of dental time at present of around 9% of that required to meet demand. The graph illustrates clearly that the under supply of dentistry is projected to increase markedly up to 2011, assuming no interventions to affect the supply of dental staff or the demand for their services. This gap between supply and demand is expected to persist but not grow at such a substantial rate between 2011 and 2021.
Section 3: Future Dental Workforce Planning

3.1. As has been said earlier, whilst we are reasonably confident that there will increasingly be a gap between demand and supply, we are unable to measure that gap precisely. This is because of the unknown effects of future changes, whether in the arrangements for NHS dentistry, in the tasks which can be delegated to PCDs, or indeed changes in society more generally which may have an impact on working patterns. This means that we must take steps to keep dental workforce issues under review, so that we can adjust the steps to be taken to close the gap in the light of experience.

3.2. We intend, therefore, to undertake biennial update reviews. This work will be set in the context of the Primary Care Workforce Planning Framework (released on 23 May 2002) and will involve workforce development bodies at national and local levels. The key components of the planning framework are set out in Annex D.

3.3. All these components have only recently been set up. It will take time to establish planning processes within these arrangements.

3.4. A dental workforce planning system is outlined in the following diagram.

Figure 10: Dental Workforce Planning System

3.5. The National Workforce Development Board (NWDB) will provide a strategic overview of the future shape and size of the dental workforce.

3.6. The Workforce Numbers Advisory Board (WNAB) will advise NWDB on the future numbers that should go into training for dental schools and institutions providing qualifications for those wishing to enter the PCDs.
3.7. Care Group Workforce Teams (CGWTs) will need to address how the oral health care needs of their client groups can best be met from a workforce perspective. Oral health will be a significant issue for some, but not all, the CGWTs. They are expected to clarify where there may be shortages or needs for certain skills in the dental workforce.

3.8. The work of these national bodies will be underpinned by national modelling work and local planning.

3.9. National modelling work on the demand and supply for the whole dental workforce will be developed in a pragmatic way, which can be refined over time. This work will take account of the impact of future policy changes. It will also take into account the National Institute of Clinical Excellence’s review of the evidence on the recall interval and the impact of changes to this on the dental workforce.

3.10. More data is required in relation to dental practice to support improved workforce planning and a feasibility study will help clarify not only what information should be available but how it can best be obtained.

3.11. Further work will be undertaken to model the contribution of PCDs to ensure an accurate picture of the future supply of dental clinical time is available to inform workforce planning.

3.12. As stated earlier, there is currently insufficient data to meaningfully model and make projections for dental nurses and technicians. This is a task that future workforce planning will need to address. Once the GDC’s proposals for the registration of Professionals Complementary to Dentistry has come into effect it will be possible to begin having a clearer picture of the present supply of dental nurses and technicians.

3.13. At local level, bearing in mind the mixed economy in the provision of dental services, Strategic Health Authorities/Workforce Development Confederations (SHAs/WDCs) may be best placed to address supply and demand issues, since they bring together all the stakeholders in the local health economy. They will need to set their work in the context of the national modelling work on supply and demand for dental services and the Primary Care Workforce Planning Framework. Their local plans will reflect local intelligence on issues like labour market supply and will in turn inform the national workforce bodies as well as the planning activities of Primary Care Trusts (PCTs).

3.14. PCTs should monitor their dental workforce needs in relation to:
   • current and future estimates of demand,
   • the development of new roles or skills within the dental team.

3.15. Workforce planning is a by-product of good management. As such, a PCT will need to have regard to:
   • succession planning,
   • skill mix reviews,
   • education and training (both as purchaser and provider),
   • recruitment and retention,
   • continuing professional development (CPD),
   • career development.

3.16. PCTs will need to work closely with SHAs/WDCs to take account of national workforce modelling on dentistry as well as identifying the oral health needs of their populations.
## Annex A

### Terms of Reference and Membership of External Reference Group

#### Terms of Reference


- Review workforce planning arrangements for all primary care dental staff in the NHS. Primary care dental staff includes dentists and all professionals complementary to dentistry.

- Make recommendations about how best dental workforce planning should be organised to support delivery of the dental strategy and further policy developments.

#### Membership of External Reference Group

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ray Appleby</td>
<td>Association of Community Health Councils for England and Wales</td>
</tr>
<tr>
<td>Brian Avery</td>
<td>Royal College of Surgeons</td>
</tr>
<tr>
<td>Paul Batchelor</td>
<td>Eastman Dental Hospital</td>
</tr>
<tr>
<td>Professor Trevor Burke</td>
<td>Professor of Primary Dental Care, Birmingham Dental Hospital</td>
</tr>
<tr>
<td>Janet Clarke</td>
<td>Birmingham Dental Hospital</td>
</tr>
<tr>
<td>Irene Ellis</td>
<td>British Association of Dental Therapists</td>
</tr>
<tr>
<td>Professor David Gibbons</td>
<td>Department of Public Health and Oral Health Services Research, Guy's Hospital</td>
</tr>
<tr>
<td>Tony Griffin</td>
<td>Chair, Dental Technicians Association</td>
</tr>
<tr>
<td>Mark Griffiths</td>
<td>Clinical Support Development Manager, North East London Workforce Development Confederation</td>
</tr>
<tr>
<td>Simon Hampton</td>
<td>Past Director, National Dental Purchasing Unit</td>
</tr>
<tr>
<td>Judy Hargadon</td>
<td>Director of Changing Workforce Programme, Department of Health</td>
</tr>
<tr>
<td>Professor Bill Hume</td>
<td>Dean, Dental School, Leeds Dental Institute</td>
</tr>
<tr>
<td>Gay Kettle</td>
<td>British Association of Dental Therapists</td>
</tr>
<tr>
<td>Rosemary Khan</td>
<td>Dental Hygienist/Oral Health Promotion Manager, Community Dental Service, Sheffield</td>
</tr>
<tr>
<td>Dr Anthony Kravitz</td>
<td>Chairman, General Dental Services Committee, British Dental Association</td>
</tr>
<tr>
<td>Stephen Lambert Humble</td>
<td>Faculty of General Dental Practitioners</td>
</tr>
<tr>
<td>Colin Lee</td>
<td>Dental Technician</td>
</tr>
<tr>
<td>Peter Leopard</td>
<td>Royal College of Surgeons</td>
</tr>
<tr>
<td>Dr Alison Lockyer</td>
<td>Non-Executive Director, British Dental Association Executive Board</td>
</tr>
</tbody>
</table>
Annex B
Approaches to Workforce Planning

1. This section discusses the various approaches to dental workforce planning. Figure 1 outlines the most common approaches. Some of these are more suitable for national planning and some more suitable at regional and local level. In practice, due to the resources and complexities involved, econometric methods and scenario modelling tend to be used at national level. Scenario modelling is used as the basis for assessing likely national demand and supply trends in dentistry for this report.

Figure 1

<table>
<thead>
<tr>
<th>Approaches</th>
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</thead>
<tbody>
<tr>
<td>1. Projections from workforce to population ratios</td>
</tr>
<tr>
<td>2. Dental practitioner opinion surveys</td>
</tr>
<tr>
<td>3. Estimates of requisite demand to absorb current capacity</td>
</tr>
<tr>
<td>4. Need-based, demand weighted studies</td>
</tr>
<tr>
<td>5. Econometric studies</td>
</tr>
<tr>
<td>6. Scenario models</td>
</tr>
</tbody>
</table>

Approach 1 – Workforce to population ratios

2. This is one of the simplest and most widely used methods of planning and has the advantages of simplicity and transparency. In practice proponents have focused on dentist to population ratios with PCDs tending to be neglected. The technique attempts to estimate the supply of dentists in some future year by examining the current stock of practitioners and flows in and out. Such analyses suggest either an under or over supply of dentists according to an arbitrary ratio of the dentist stock figure to the population. This ratio is often benchmarked against other areas or countries. This approach has been used at national and sub-national level. Ratios have been criticised on several grounds. A key criticism is that they assume technology and productivity in dentistry is fixed both across areas and through time.

Approach 2 – Dental practitioner surveys

3. This approach involves questioning practising dentists on the size and structure of practices and eliciting their opinion on shortages or gluts. Questions may be asked on how busy dentists are or how many extra patients they could take on. On the basis of this particular communities may be designated as dental workforce shortage areas. The approach benefits from simplicity and the fact it may give some idea of the relative importance or extent of problems and perceived barriers to recruitment – particularly at local level. The drawback is that it is open to gaming by respondents, where responses may reflect the interests of the respondent rather than their views on the actual position.
Approach 3 – Estimates of requisite demand to absorb current capacity

4. Approaches 3 to 5 are progressively more complex. Most users of this approach have used the volume of dental visits as an indicator of demand and supply. The basic method is to compare the volume of dental visits a population will demand to the supply of visits available to determine shortage or surplus in the sector. Demand by age-group or socio-economic group tends to be assessed by surveys of utilisation such as the Adult Dental Health Surveys, while supply tends to be estimated by the methods in approach 2, or some estimate of the total supply of visits available based on average lengths of visits. An important assumption is that the pattern of demand by age or socio-economic group will be similar in the future – although this can be overcome to some extent by extrapolating trends.

Approach 4 – Needs-Based, Demand-Weighted Studies

5. The approach above takes demand for dentistry as the appropriate measure for assessing the demand for the workforce. This can be extended to take into account the underlying oral health needs of the population. This requires a slightly more complex procedure where trends in dental health status need to be translated into need for services (usually by an expert panel), need can then be translated into the supply implications by looking at time required to service need by role or staff type. A further amendment is sometimes made to take into account that not all need will be expressed as demand – this can reduce to the requisite demand approach, depending on expectations of the weighting in the future.

Approach 5 – Econometric models of the dental sector

6. Approaches 3 and 4 go further than the basic models by factoring in disease levels and utilisation rates of the population but they still rely heavily on historical patterns. They also fail to address the fact that utilisation – and therefore the workforce needed – is the result of interaction between demand and supply. Econometric methods allow these subtle interactions to be taken into account. However, they also have drawbacks; they are not transparent and often difficult to understand to all but the modellers, sometimes highly sensitive to assumptions and can take many years to develop and validate. A good example is the American EMODS model that has been over 30 years in development. Econometric models are a long-term modelling option at the national level but will not provide guidance in the timescale of this report.

Approach 6 – Scenario models

7. This is a catch-all term since the models can be based on any of the previous categories. What distinguishes them is their complexity, size and the ability to look at different future scenarios for key variables and to track the impact on dental demand and workforce supply. The models developed by the British Dental Association (BDA), previous Dental Workforce Advisory Committees, our own modelling, and the model developed for the Dutch government fall into this category. Our model is explained below at some length in the text.

8. The Dutch Scenarios Model is one of the most sophisticated workforce planning models developed to date. A similar national model for England is a long-term possibility but again will not provide guidance in the timescale of this report – the Dutch model took 4 years to develop into its final form. The aim of the Dutch model is to allow users to simulate what ‘may’ happen given changes to specific factors. This has advantages over trends-based models based purely on historical changes in attendance and similar variables, since the latter essentially ‘run blind’, and it is difficult to take into account step changes in specific factors on their predictions. On the other hand, trends-based models are rooted in past.
experience, are cheaper and quicker to develop and offer a good representation of the future if current
trends continue.

9. We have used a combination of trends based and scenario modelling approaches to maximise the
advantages of both the data we have and the most informed perceptions of development in the future.

Conclusion

10. The main methods used in dental workforce planning have been set out with some of their benefits and
disadvantages. Whilst more complex methods, such as econometric modelling and the Dutch model,
offer the possibility of more insight into workforce planning issues in the long run, this needs to be
balanced with the greater transparency and relative speed of the less complex approaches.
Annex C
Summary Information from the Regional Workshops

Education and Training

• A New Sort of Worker

• Dental Care Worker (DCW) I – III and Dental Support Worker (DSW) I – III
  – DSW I – ? Basic Clinical training
  – DSW II – ? Dental nurse
  – DSW III – ? Expanded dental duty nurse
  – DCW I – ? New three year PCD course
  – DCW II – ? Five year dental degree course
  – DCW III – ? Specialist dentist with extra years training
  – completely modular approach with core competencies and options for each 6 levels,
  – progression without repetition of modules from DSW I to DCW III
  – training and education a single integrated structure for anyone to progress as far as they wish
  and are able
  – DSW III would have skills to allow progress to DCW I
  – lifelong learning integral for all members of the team
  – option of pre-clinical degree before choosing dentistry, medicine or nursing etc rejected in
  favour of more flexible DSW I – III and DCW I – III

• Entrance requirements should be more flexible and less academic
  – basic academic qualifications for all
  – pre-entry assessment to assess communication skills and ability to relate to people and dexterity
  – credits for DSW if they wanted to do further education/training and progress to become DCWs
  (on current model and for transitional period)

• Education for the whole team should be aimed at needs in practice
  – communication and interpersonal skills should be learned early as basic skills for practitioners
  dealing with people
  – dentists (DCW IIs) as Team Leaders so need for management, leadership and delegation skills

• Outreach and Inreach should be integral to dental education
  – as much education and training as possible should be done in a primary care/practice
  environment
  – dental schools provide the academic base with inreach for students training in practice going in
  to be taught academic topics
– development of practice centres needed to allow this to happen (eg use Treatment Centres, polyclinics, large practices)
– over time use of training centres outside dental schools would free up space and could allow for increased intake
– e-learning should be used as part of overall educational programme

• Ongoing curriculum review to meet changes in patient need
– need to quantify treatment dental team would be providing in the future (data from DPB and ADHS and CDHS) and plan education and training to deliver
– knowledge base would need to reflect changes in disease/condition incidence
– CPD should also be planned to deliver needs of all members of the dental team to enhance patient care

Recruitment and Retention

• If we are to make dentistry a place where people want to come and work then a number of building blocks need to be in place:
  – a clear direction and policy for dentistry.
  – a decent quality of life for all staff in the dental team.
  – a flexible and integrated career structure for all members of the team.
  – available and funded training for all PCDs
  – flexible improved rewards packages.

• A clear direction and policy for dentistry, underpinned by:
  – strong leadership nationally and locally, which will require the development of leadership skills.
  – the integration of dentistry into the mainstream NHS.
  – cross-sector working
    – focused efforts in socially disadvantaged areas to encourage people to enter dentistry and practise locally.
  – a clear strategy for the location of training and subsequent work placement outwith the traditional dental school environment.
  – a short term national focus on international recruitment.

• A decent quality of life for all staff in the dental team through, for example:
  – flexible working practices.
  – supportive working environments.
  – effective management.
  – reduced bureaucratic demands on dentists through increased practice management support e.g. via PCT.

In this Annex, PCDs include practice receptionists and managers, as well as dental nurses, dental technicians, dental hygienists, dental therapists.
– creating networks of GDPs to maximise staffing resources and facilitate more flexible employment.
– ensuring safe environments – security ‘out-of-hours’ etc.
– remuneration which supports employee commitment to flexible working.

• A flexible and integrated career structure for all members of the team.
  – develop cross sector GDS, CDS, HDS working for team members to create more interesting jobs.
  – support the development of transferable skills.
  – the development of wider (i.e. beyond dentistry) NHS careers.
  – address the changing career expectations of those entering the profession e.g. desire for career breaks, reduced time commitment to dentistry.
  – create more flexible posts to allow career breaks and ease of return.

• Available and funded training for all PCDs incorporating:
  – pre and post qualification training.
  – designated training practices.
  – centres of excellence.
  – modular training pathways.
  – recognition of training needs in remote areas.

• Flexible improved rewards packages.
  – removal of Whitley ‘inflexibilities’ for salaried PCDs
  – improve Terms and Conditions of Service for trainee dental nurses
  – paying PCDs for additional competencies or responsibilities
  – desire of young graduates to work as salaried dentists
  – promote and facilitate the development of salaried GDPs through PDS, as per GMS → PMS
  – flexible rewards and support packages to facilitate extended hours of working.

Team Working

• What procedures/duties could be delegated from dentists to other members of the dental team?
  – Oral health promotion advice
  – Scale and polish
  – Periodontal work
  – Taking of impressions
  – Taking of radiographs
  – Simple fillings
  – Repairs to dentures
  – Triage
• What is the ideal composition of the dental team?
  – Dentist
  – Therapist
  – Hygienist
  – Technician (Clinical Dental Technician) probably working remote from practice
  – 2 nurses

• What are the barriers to team working?
  – Space – 42% of practices in the South West are single-handed (although all have nurses)
  – Recruitment and retention problems – 14% of practices could not recruit hygienists, nurses stay for an average of 3 years
  – Resistance from dentists
    – 52% of practices would welcome PCDs
    – 72% of practices employed a hygienist and a further 14% would employ one if available
    – 44% would employ a dental therapist
  – Enough work
    – 30% of practices had enough work to keep a full team of hygienist, therapist and technician occupied
  – Fee scale
  – Statement of Dental Remuneration (SDR) would need to be revised to provide ‘salary’ for PCD and overhead for dentists’ supervision and on-costs

• How could the barriers to team working be overcome?
  – Single-handed practices – capital funding for practice premises (LIFT)
  – Recruitment and retention – raise status through registration, open up career potential through modular training
  – Resistance from dentists – develop role of dentist as team leader including prescription of treatment, QA, management of PCDs, either providing specialist treatments or organising referrals, (this would also ensure that dentist post would be well-loaded)
  – SDR – options for change?

• What is a realistic pace of change for introducing new ways of team working?
  – Need for evaluation before training of PCDs is expanded too rapidly
  – ‘Pilots’ not popular but some kind of trial necessary

• What consequences might new ways of working have for education and training provision?
  – Two routes to becoming dentist;
    – A Fast progression through modules feeding hospital dentistry specialties, some GDPs
    – B Moderated progression through modules feeding mainly general practice.
  – This should be a flexible resource which could be made responsive to changes in demand and organisation of dentistry
Public/Consumer Issues

- There should be agreed and targeted local objectives for dental services.
  - Developing local standards must be shared with the public/consumer.
  - Recognise different expectations between consumer groups.
  - Access and equity in access.
  - Develop team approach in dental services enhancing the use of PCDs.
  - Terms and conditions of service should be reviewed so that treatment is not remunerated ahead of prevention.
  - A National Service Framework for oral health care services.

Workforce Planning

- Workforce planning should be part of an annual cycle.
- Encourage skills development within and across disciplines.
- Individuals should be able to progress across current boundaries.
- Workforce planning needs to capture all elements of the dental team.
- Essential common postcode based data set should be aggregated from local to national.
- Workforce planning should be based on patient need and oral health.
- Measure skills as well as people.
- Integrated modular training for whole dental team.

General Messages

- Workforce planning should help to integrate dentistry into mainstream NHS activity.
- Workforce planning should take account of need and demand.
- Preventive dental care needs to be addressed and reflected in workforce planning.
- Workforce planning should cover the whole dental team.
- Dental workforce planning should be a regular activity planning for a period of years ahead.
- Be aware that new workforce planning activity may have information consequences
- Consider skills required for whole dental team.
- Aim for equitable distribution of dental services.
- Career structures should be developed for the whole dental team.
- Need to pilot and evaluate new ways of working in dental services.
- Learning and personal development should be a lifelong activity for the whole dental team.
- More flexible career and training packages.
Annex D

Workforce Planning Structures

National Workforce Development Board (NWDB)

1. The NWDB is intended to provide a long-term focus on workforce planning and development for the NHS. It advises the Secretary of State on broad workforce development issues and translates strategic aims into an agenda for action. Its purpose is to provide a strategic overview at national level of all health service workforce issues and ensure this is built into the development of local service plans.

Workforce Numbers Advisory Board (WNAB)

2. The WNAB is a technical group that advises the NWDB on the overall numbers of undergraduate/pr-registration and postgraduate/post-registration education and training places to be commissioned in each staff group. On the basis of information from local plans it advises the NWDB on the targets for workforce distribution and the number and location of training places that will best support this aim.

Care Group Workforce Teams (CGWTs)

3. CGWTs have been established to take a national overview of the workforce implications, in terms both of numbers and skills and competencies, of delivering national commitments on services. They currently cover:
   - coronary heart disease
   - mental health
   - cancer
   - emergency care
   - older people
   - children
   - long-term conditions (to include renal and diabetes services).

Strategic Health Authorities/Workforce Development Confederations (SHAs/WDCs)

4. SHAs/WDCs bring together local NHS and non-NHS employers to plan and develop the whole healthcare workforce. This new approach to planning recognises that the NHS is not the only employer of healthcare staff, and that local authorities, private and voluntary sector providers and others need to work together if workforce planning and development is to be effective and meet the healthcare needs of local populations.

5. SHAs/WDCs bring together both NHS and non-NHS member organisations which need to work particularly closely to deliver on workforce issues in the context of the NHS Plan and local priorities.
6. SHAs/WDCs play a key role in driving forward work to increase staff numbers and change the way in which staff are trained and educated. An important part of their role is to develop and spread improved ways of working that tackle problems of recruitment and retention, and which enhance the working lives of staff.

7. SHAs/WDCs are key players, in modernising the healthcare workforce.

8. SHAs/WDCs local membership includes:
   - Ambulance Trusts
   - Care Trusts
   - NHS Trusts
   - Primary Care Trusts
   - Postgraduate Deaneries

They also need to ensure the effective involvement and engagement of a wider membership so that their needs are taken into account in healthcare workforce planning development and education generally, and to ensure joint learning opportunities are exploited. The wider membership includes:
   - Councils with social services responsibilities and other social care employers,
   - Further Education Institutions,
   - Higher Education Institutions,
   - Independent Sector organisations,
   - Learning and Skills Councils,
   - Ministry of Defence,
   - National Blood Authority,
   - NHS Direct,
   - Prison Service,
   - Voluntary Sector organisations.

9. To ensure that their strategies and plans reflect wider labour market issues, SHAs/WDCs will also need to work closely with other government stakeholders, for example Government Offices for the Regions.

Primary Care Trusts (PCTs)

10. PCTs are responsible for assessing the needs of their local population, reducing health inequalities and improving health. To achieve this they will need to consider and redesign services along care pathways. The volume and complexity of health and social care in the home and practice are growing rapidly. Responses to this must be patient and community centred while also flexible and creative. All primary care staff will need to live and work in a continuously changing environment that makes workforce planning more important than ever.
Overall Structure

11. The following diagram shows how all these components fit together.

Figure 1 Workforce Development Structures
Report of the Primary Care Dental Workforce Review can also be made available on request in braille, on audio cassette tape, on disk and in large print.

www.dh.gov.uk/publications