NHS Dental Epidemiology Programme for England

Oral Health Survey of 5 year old Children 2007 / 2008

October 2009
Introduction

For the past 20 years nationally coordinated surveys of child dental health have been undertaken across the UK which produced robust, comparable information which could be used at local level and compared regionally, nationally and internationally. These surveys have been jointly run by the NHS and the British Association for the Study of Community Dentistry (BASCD).

The information produced from the nationally coordinated surveys of child dental health is used by Primary Care Trusts (PCTs) when conducting oral health needs assessments at local level and forms an important component of the World Class Commissioning approach.

In recent years concern was expressed by all parties about compliance with the programme and the quality of the data. New arrangements were established in England during 2006/07 which embedded the programme within the governance of the NHS and maintained the important advisory role of BASCD in ensuring quality standards. The NHS Dental Epidemiology Programme for England was established (NHS DEP) and is delivered in accordance with Directions (DH, 2008) made under the Functions of Primary Care Trusts (Dental Public Health) (England) Regulations 2006 (OPSI, 2006).

The North West Public Health Observatory (NWPHO) and The Dental Observatory (TDO) worked with the Department of Health (DH), BASCD and other stakeholders to develop the NHS DEP.

This report gives details of the survey of 5 year old children in the school year 2007/8, the first dental survey to take place under these new arrangements.

Methods

The survey was undertaken during the school year 2007/8. The sampling frame was children attending mainstream schools who were aged 5 years at the time of the survey. Data was collected by trained and calibrated examiners employed by PCTs. The training and calibration of examiners was carried out using the methodology described by Pine (Pine et al, 1997a). BASCD criteria for clinical examination (Pitts et al, 1997) were employed as in previous surveys. This involves visual-only detection of missing teeth, filled teeth and teeth with obvious dentinal decay. The presence and absence of plaque and oral sepsis were also recorded.

The survey was conducted according to a standard protocol which gave details of the sampling methodology to be employed (based on Pine et al, 1997b). For the first time the primary sampling unit was Local Authority (LA). Samples were drawn for each LA in England using the same methods and similar sampling intensities as used in the past. The methodology also allowed for representative PCT samples.
Following guidance from the Deputy Chief Dental Officer in 2005, the protocol also required that positive consent was obtained prior to the survey from the child’s parent or from someone with the competence to give consent on behalf of the child. In previous surveys, parents were informed about the survey and unless the parents objected, children were examined.

The data were collected using the Dental Survey Plus 2 computer program and electronic files of the raw, anonymised data were sent to TDO via a secure web portal. Data cleaning and quality checks were undertaken before the data was transferred to the NWPHO for analysis.

Population weighting\(^1\) was used to calculate estimates of a range of measures of oral health for each LA and PCT. The postcode of residence for each record was used to assign a deprivation score and these were then used to allow weighting of the sample data to more closely match the actual distribution of deprivation quintiles\(^2\) in the source population.

**Results**

In total 147 out of 152 PCTs took part in the survey covering 338 out of 354 Local Authorities. A total of 139,727 clinical examinations were included in the final analysis.

The overall response rate to the survey samples was 66.8%. Possible non response bias cannot be ruled out and comparisons with other surveys should not be made without reference to the response levels.

Headline results are presented here along with an indication of the range of results and some high level illustrations. The full tables of results at PCT, LA and regional level are available at [www.nwph.net/dentalhealth](http://www.nwph.net/dentalhealth). Reference to dental decay in these results relates to obvious dental decay into the dentine of the tooth and is indicated by \(d_3\).

**Experience of dental decay at age 5**

At a national level there are significantly more children (69.1%) who are free from obvious dental decay than those who have at least one decayed, missing or filled tooth (30.9%). At a PCT level however there are wide variations ranging from the East Riding of Yorkshire where only 17.7% have experience in dental decay to Middlesbrough PCT where the figure is 53.4%. Figure 1 shows the differences across the country at the Strategic Health Authority (SHA) level.

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1 The sampling methodology utilised for this survey was school based and therefore not truly representative of the population of five-year-old children by IMD quintile. Thus, the sample was treated as a stratified random sample i.e. children were selected randomly from each IMD quintile, but the sampling probability varied between IMD quintiles. For this reason, IMD-weighted estimates were produced to provide more robust estimates of overall prevalence.

2 Deprivation quintiles divide populations into fifths according to the Index of Multiple Deprivation, and are used to identify the range of deprived and affluent sections of the population.
Severity of dental decay at age 5

Across the whole of the population examined the average number of dentinially decayed missing or filled teeth (d\textsubscript{3mft}) per child is 1.11. Figure 2 shows the differences across the country by SHA, whilst the distribution across PCTs is shown in Figure 3. This ranges from 0.48 in West Kent to 2.50 in Brent.

Figure 1 : Percentage of 5 year old children with decay experience (d\textsubscript{3mft} > 0) including 95% confidence limits. Strategic Health Authorities, 2007/08.

Figure 2 : Average number of dentinially decayed, missing (due to decay) and filled teeth (d\textsubscript{3mft}) in 5 year old children including 95% confidence limits. Strategic Health Authorities, 2007/08.
Figure 3: Average number of dentinally decayed, missing (due to decay) and filled teeth (d$_3$mft) in 5 year old children. Primary Care Trusts, 2007/08.

Given that across England as a whole, this dentinal decay only occurs in 30.9% of the population it is important to consider the average number of decayed missing or filled teeth among those children who are not free of obvious disease (i.e. children with a d$_3$mft > 0). Children who have the disease, have on average 3.45 teeth affected. This figure also varies widely from 2.40 teeth affected in North Lincolnshire to 5.47 in Brent.
The number of decayed teeth at age 5

The number of teeth with obvious dentinal decay makes up the largest component of the d₃mft index (Fig 4) and, on average, 5 year old children in England have 0.87 teeth decayed into dentine. Again there is wide variation from 0.30 in West Kent to 2.24 in Brent.

The number of filled and missing teeth (due to dental decay) at age 5

The number of filled teeth and missing teeth make up the smaller portions of the total d₃mft index present in 5 year old children. At a national level the average number of filled teeth is 0.12 and the average number of missing teeth is also 0.12. The combined components of the d₃mft index are shown for each SHA in Figure 4.

Figure 4: Components of d₃mft (number of dentinally decayed, missing (due to decay) and filled teeth) in 5 year old children. Strategic Health Authorities, 2007/08

The Care index

The care index is the proportion of teeth with caries experience which have been filled, derived by taking the number of filled teeth and dividing by the total number of dentinially decayed, missing and filled teeth and converting to a percentage (ft/d₃mft). There are different schools of thought regarding the appropriateness and benefit of filling decayed deciduous teeth and a lack of definitive evidence based guidance on this. In using this Care Index data, care
should be taken in making assumptions about the extent or the quality of care available.

The care index is 14% across England as a whole and varies considerably from 4% in Hull to 33% in South Gloucestershire.

**Children with sepsis at the time of the examination**

Sepsis was defined as the presence of a dental abscess or sinus which was recorded by visual examination of the soft tissues. Across England 2.3% of 5 year old children showed signs of sepsis and as expected the level was generally higher in those areas where there were higher levels of decay. For example the highest levels occurred in London (3.4%) and the lowest in the South East Coast and West Midlands SHAs (both 1.6%) Figure 5.

**Figure 5 : Percentage of 5 year old children with evidence of Sepsis. Strategic Health Authorities, 2007/08.**

**Discussion**

One of the benefits of the nationally coordinated programme using standardised BASCD criteria has been the ability to look at trend data over time. This had been possible because the methodology used in the conduct of the surveys had remained constant. As described in the introduction this is the first survey to be carried out following a number of methodology changes. A thorough investigation of the likely impacts of these changes has been undertaken and, whilst most are felt to have had limited impact on the results
of the 2007/8 survey, it has not been possible to quantify the effect of the introduction of positive consent. The requirement for parents to give positive consent for the examination has introduced possible bias.

Only a small proportion of parents actively stated that they did not want their child included in the survey. Simple non-response to the request for consent was far more common. The non responders in the survey tend to be from the more deprived areas and there is an established relationship between deprivation and dental decay whereby children from more deprived areas tend to have higher levels of dental decay (Mellor, 2000: ONS, 2003). Although the data has been weighted to model the underlying deprivation profile of the population, it is possible that the non responders have different levels of dental decay, over and above that explained by deprivation alone. No clinical data exists on this missing part of the sample and therefore it is not possible to model or measure the impact that this has had.

In previous surveys the response rates of 75.0% and above have been readily achieved and considered by BASCD to provide sufficient confidence to enable publication and comparison with the results of previous surveys. In England during 2007/08, only 66.8% of the drawn sample were included in the final analysis therefore national level comparisons with previous surveys cannot be made with confidence.

At other geographic levels response rates vary widely. Across SHAs the response varied from 58.4% in London to 75.1% in South Central. On a PCT level it varied from 24.3% in Bournemouth and Poole to 90.3% in Tameside & Glossop. Again, it is recommended that comparisons with other surveys are not made without first carefully examining the response rate.

Whilst the results of this survey are not directly comparable with those of the previous series for the reasons outlined, the ranking of the SHAs and the geography of the inequality in disease levels is broadly consistent with previous surveys.

Methods of improving response rates and the representativeness of the children examined are currently under consideration

References


