



# **NHS Dental Epidemiology Programme for England**

## **Oral Health Survey of 12 year old Children 2008 / 2009**

**Summary of caries prevalence and severity results**

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## Introduction

This report gives details of the oral health of 12 year old children surveyed in the school year 2008/9, the second national dental survey to take place under new arrangements for the NHS Dental Epidemiology Programme (NHS DEP) for England.

Nationally coordinated surveys of child dental health have been undertaken across the United Kingdom (UK) since 1985 which have produced robust, comparable information for use at local, regional and national levels, with the first survey of 12 year olds being undertaken in 1993. In England these surveys are now led by the North West Public Health Observatory (NWPHO) and The Dental Observatory (TDO) working with the Department of Health (DH) and the British Association for the Study of Community Dentistry (BASCD). Each primary care trust (PCT) commissions its local providers to undertake the fieldwork according to a national protocol and thereby fulfils its obligations according to the Statutory Instrument 185 (2006) and the accompanying Directions (DH, 2008) made under the Functions of Primary Care Trusts (Dental Public Health) (England) Regulations 2006 (OPSI, 2006).

The information produced from the nationally coordinated surveys of child dental health is used by PCTs when conducting oral health needs assessments at local level and forms an important component of the commissioning of local services.

The survey reported here provides information on the caries prevalence and severity of 12 year olds attending state schools. Additional reports will provide information about the demand and need for orthodontic intervention in this age group, experience of oral discomfort and the impact it has on quality of life, self-perception of enamel opacities<sup>1</sup> of front teeth and brushing habits.

## Methods

The survey was undertaken during the school year 2008/9. The sampling frame was children attending mainstream schools who were aged 12 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. In addition the need and demand for orthodontic intervention were measured along with self perception of enamel opacities<sup>1</sup>, self reporting of oral symptoms and the impact they had on quality of life and brushing frequency and the presence and absence of plaque.

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). 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 set out the methods to be used to gain consent from the pupils themselves. This involved

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<sup>1</sup> White marks that appear as fine bands or dots on some teeth in some individuals. There are many causes for these.

providing letters to the parents of all sampled pupils to inform them of the nature and purpose of the survey and give them the opportunity to withdraw their child. All non-withdrawn children received explanations of the nature and purpose of the survey, given the opportunity to ask questions and asked for their consent. 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 NWPCHO for analysis.

Population weighting<sup>2</sup> 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<sup>3</sup> in the source population.

## Results

In total, 140 PCTs out of 152 took part in the survey covering 299 out of 326 local authorities (configurations as of April 2009). A total of 89,442 clinical examinations were included in the final analysis. This represented 15% of the population of this age cohort attending mainstream state schools.

The overall response rate of pupils examined as a proportion of those sampled was 74%.

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 visually obvious dental decay into the dentine of the tooth and is indicated by D<sub>3</sub>.

Further detail relating to orthodontic need and demand, experience of oral discomfort and its impact on quality of life, self perception of enamel opacities and brushing habits will be reported within three months.

### Experience of dental decay at age 12

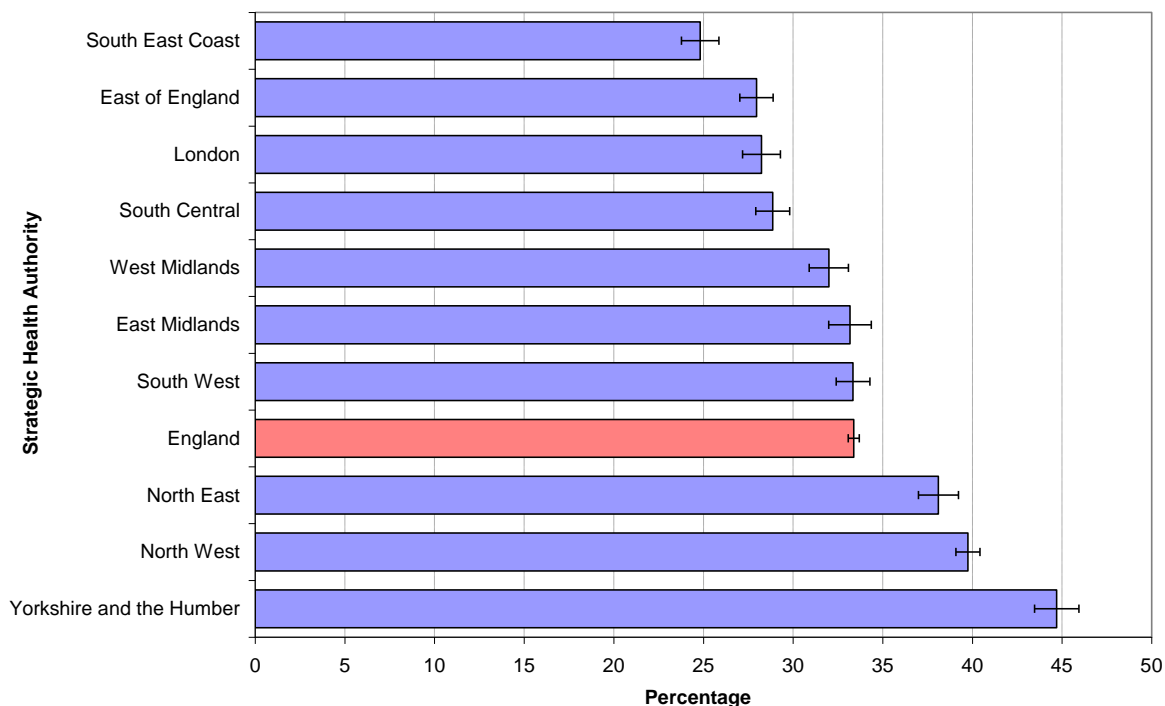
At a national level 33.4% of pupils were found to have experience of caries, having one or more teeth which were decayed to dentinal level, extracted or filled because of caries. The remaining 66.6% were free from visually obvious dental decay. At a PCT level however there are wide variations ranging from Southwark where only 12.9% have experience in dental decay to Knowsley where 56.1% were affected. Figure 1 shows the differences across the country at strategic health authority (SHA) level.

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<sup>2</sup> The sampling methodology utilised for this survey was school based and therefore not truly representative of the population of twelve-year-old children by Index of Multiple Deprivation (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.

<sup>3</sup> Deprivation quintiles divide populations into fifths according to the IMD, and are used to identify the range of deprived and affluent sections of the population.

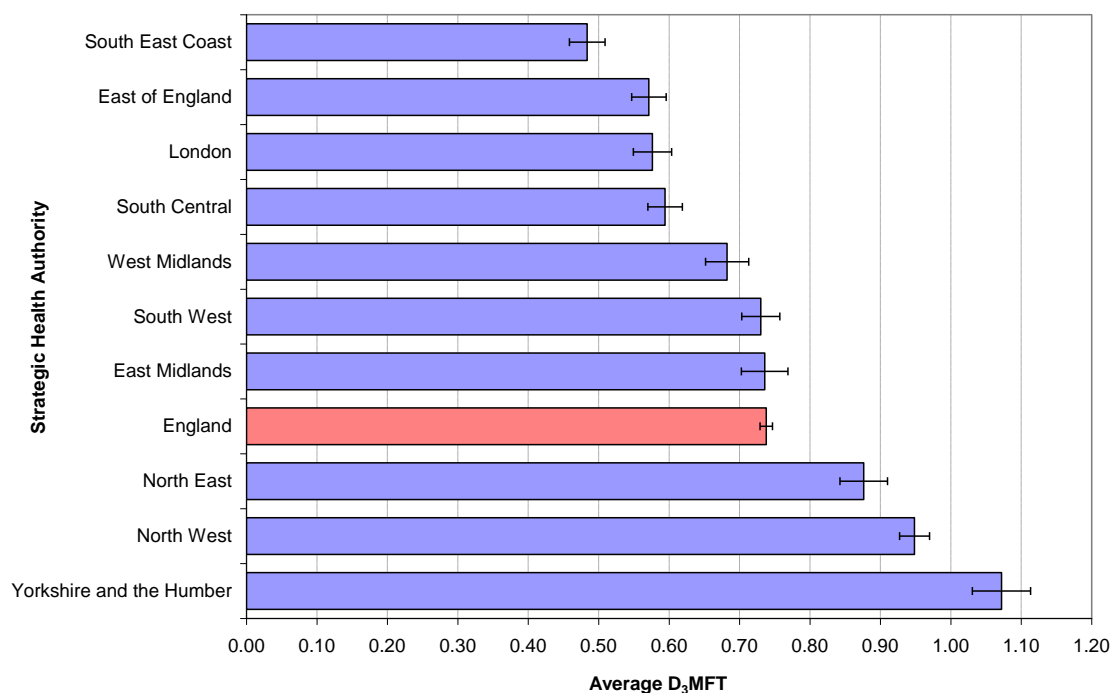
**Figure 1 : Percentage of 12 year old children with decay experience ( $D_3MFT > 0$ ) including 95% confidence limits. Strategic Health Authorities, 2008/09.**



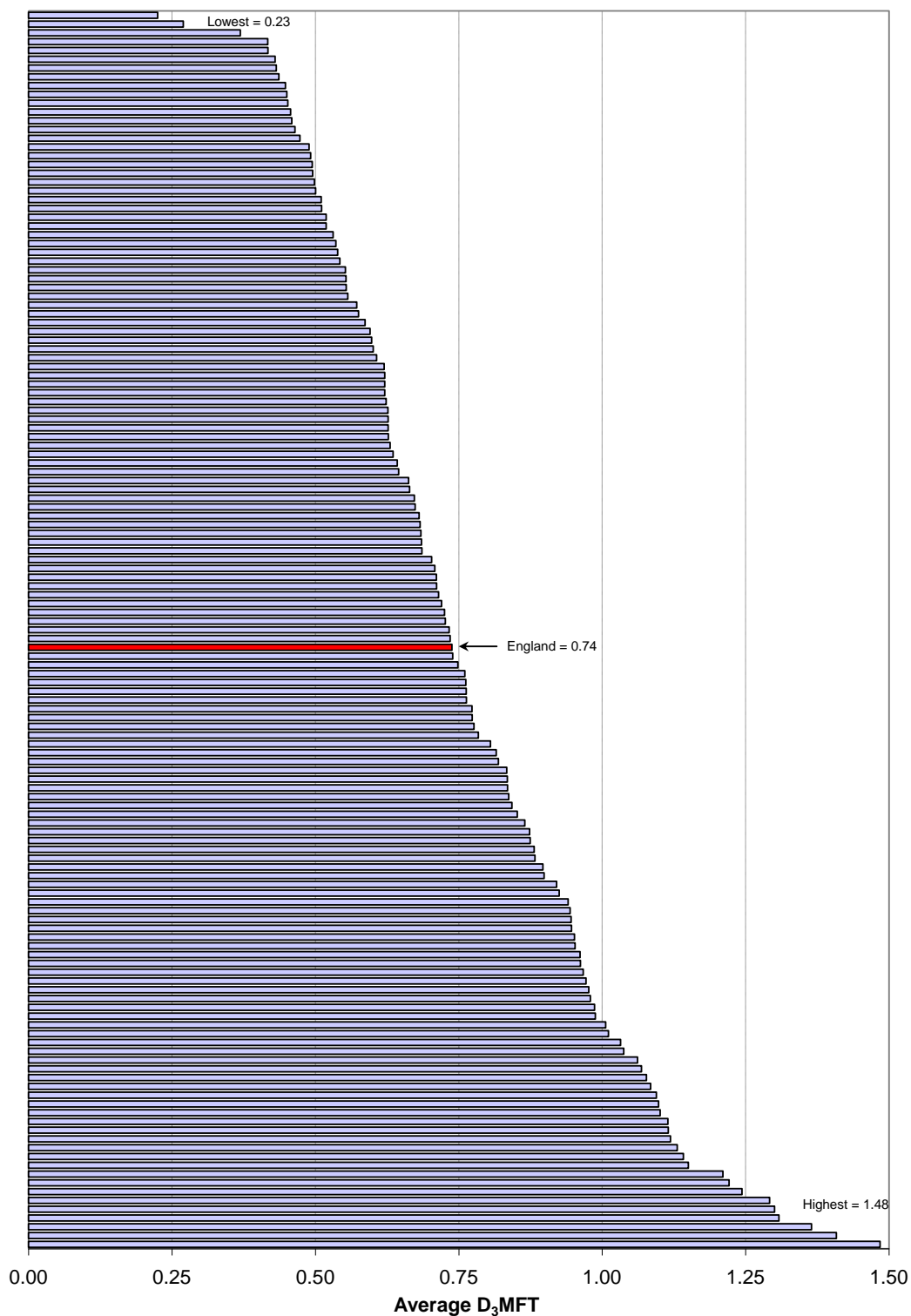
### Severity of dental decay at age 12

Across the whole of the population examined the average number of dentinally decayed, missing or filled teeth ( $D_3MFT$ ) per child is 0.74. Figure 2 shows the differences across the country by SHA, whilst the distribution across PCTs is shown in Figure 3. This ranges from 0.23 in Southwark to 1.48 in Ashton, Leigh and Wigan.

**Figure 2 : Average number of dentinally Decayed, Missing (due to decay) and Filled Teeth ( $D_3MFT$ ) in 12 year old children including 95% confidence limits. Strategic Health Authorities, 2008/09.**



**Figure 3 : Average number of dentinally Decayed, Missing (due to decay) and Filled Teeth (D<sub>3</sub>MFT) in 12 year old children. Primary Care Trusts, 2008/09.**



It is important to consider the average number of decayed, missing or filled teeth among those children who were found to have obvious disease (i.e. children with a D<sub>3</sub>MFT > 0). Of the 33.4% of children who have obvious dentinal decay, the average number of D, M, F teeth is 2.21. This figure also varies widely from 1.55 teeth affected in Brighton and Hove City to 2.91 in Calderdale.

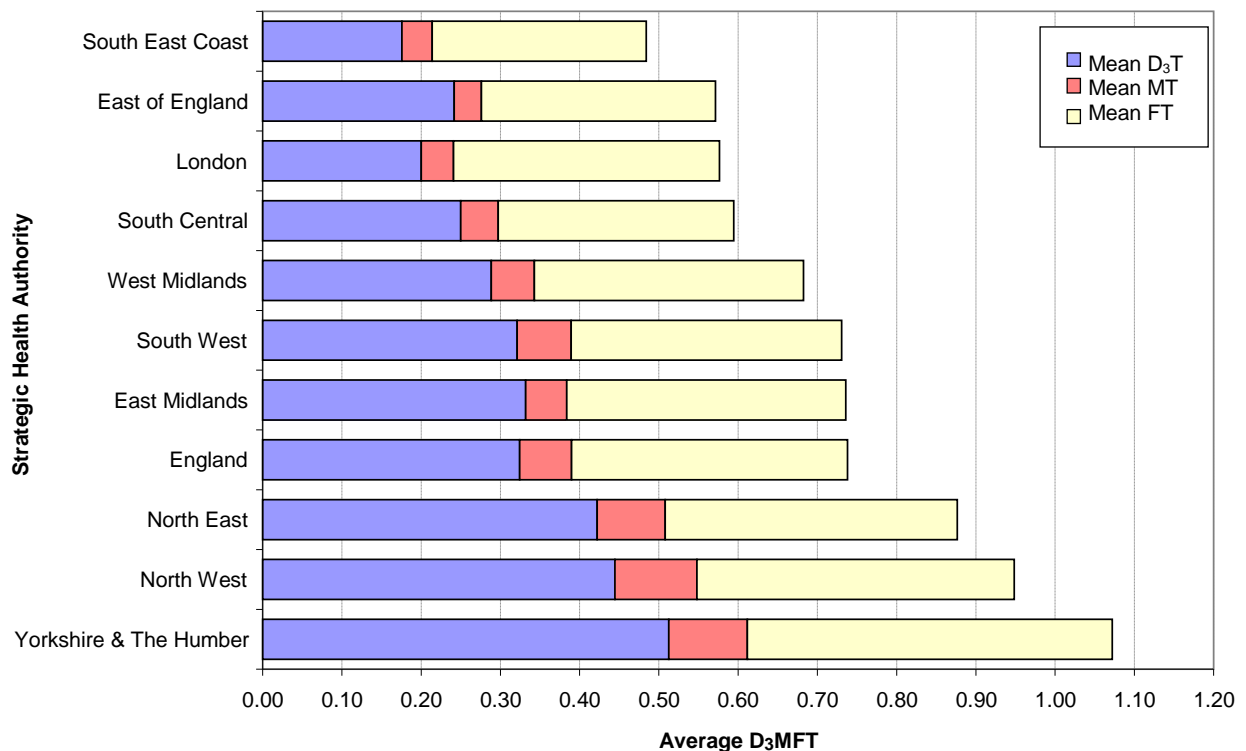
## The number of decayed teeth at age 12

The number of teeth with obvious, untreated dentinal decay contributes a significant component of the D<sub>3</sub>MFT index (Fig 4) and, on average, 12 year old children in England have 0.32 teeth decayed into dentine. Again there is wide variation from 0.04 in Brighton and Hove City to 0.92 in Ashton, Leigh and Wigan.

## The number of filled and missing teeth (due to dental decay) at age 12

The number of filled teeth makes a similar contribution to the total D<sub>3</sub>MFT index present in 12 year old children and missing teeth a far smaller portion. At a national level the average number of filled teeth is 0.35 and the average number of missing teeth also 0.07. The combined components of the D<sub>3</sub>MFT index are shown for each SHA in Figure 4.

**Figure 4 : Components of D<sub>3</sub>MFT (number of dentinally Decayed, Missing (due to decay) and Filled Teeth) in 12 year old children. Strategic Health Authorities, 2008/09.**

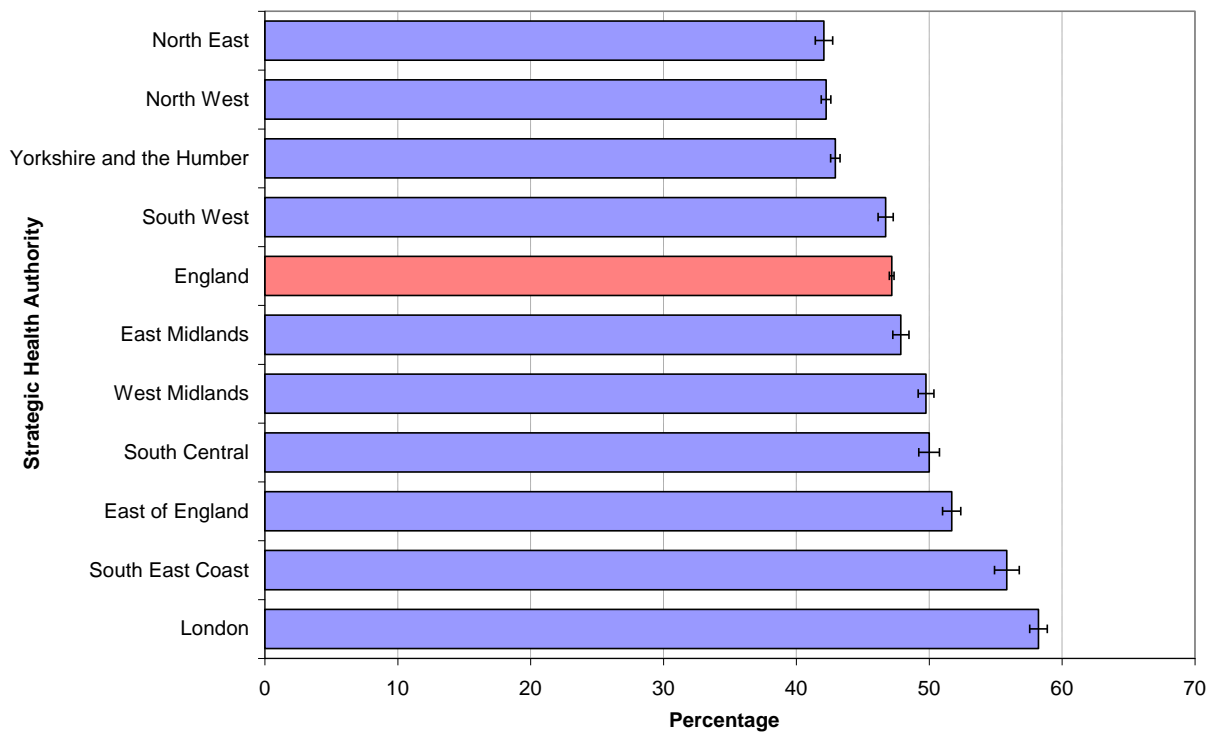


## The care index

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 dentinally decayed, missing and filled teeth and converting to a percentage (FT/D<sub>3</sub>MFT).

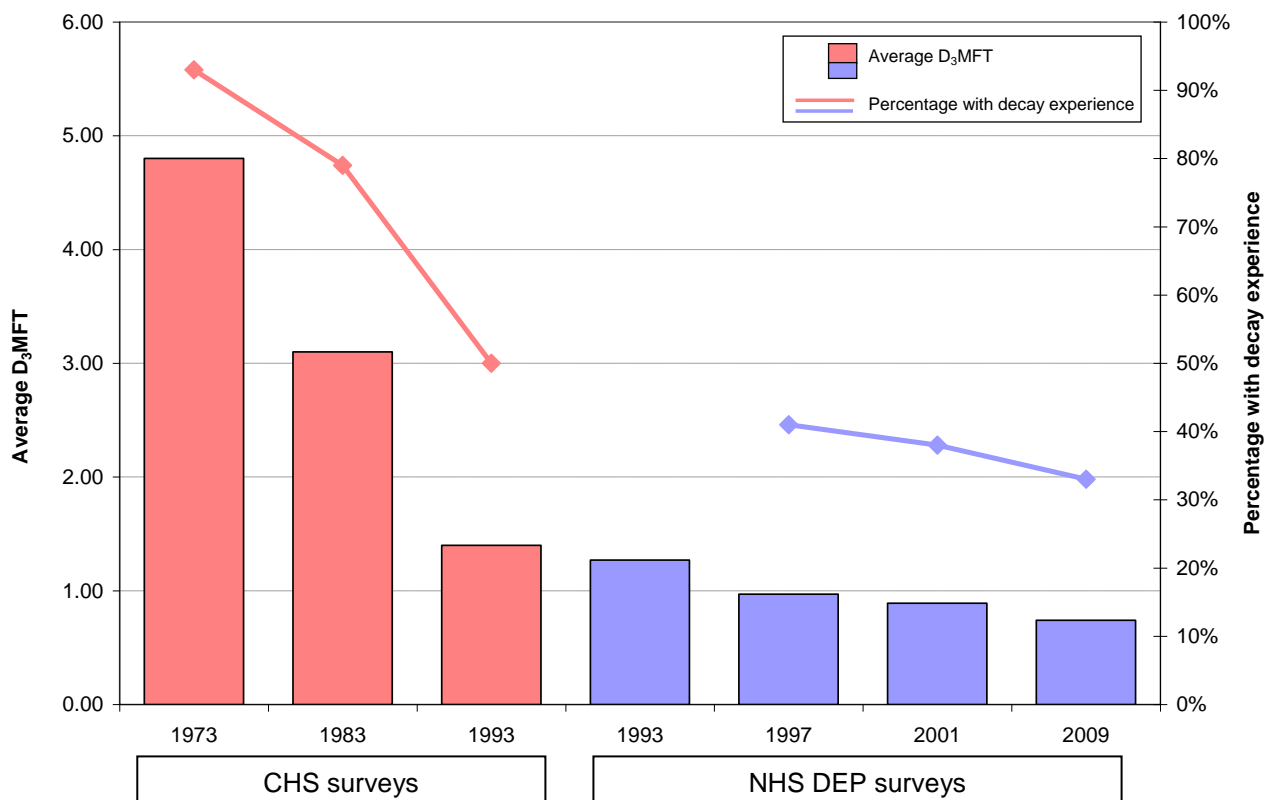
The care index is 47% across England as a whole and varies between SHAs from 42% in the North East to 58% in London see Figure 5. There is considerable variation within SHAs, for example within London SHA the index varies from 35% in Lewisham to 83% in Richmond and Twickenham. The care index should be interpreted alongside other intelligence such as levels of deprivation, disease prevalence and the provision of dental services.

**Figure 5 : Care index (FT/ D<sub>3</sub>MFT) in 12 year old children. Strategic Health Authorities, 2008/09**



There has been a trend for reducing prevalence and severity among 12 year olds for the past 26 years and this survey suggests a further decline in the levels of disease. Figure 6 combines the caries severity and prevalence levels in National Child Health surveys over the time period 1973 to 1993 and NHS DEP surveys over 1993 to the most recent survey.

**Figure 6 : Results of caries surveys of 12 year olds in England from National Child Health Surveys and NHS DEP surveys over 6 time periods.**



## 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 to conduct the surveys had remained constant. The change in methods of gaining consent for this age group appears to have had very little impact so the data can be used for comparison.

Approximately 12% of sampled schools declined to co-operate when asked by fieldwork teams. Only a small proportion of parents (7.3%) actively withdrew their children and only 6.7% of pupils declined the request to take part. Absenteeism on the day of examination accounted for loss of 11.8% of children. There was potential for any or all of these reasons for non-participation to bias the results. This proved not to be the case as weighting the results using quintiles of socio-economic deprivation had almost no effect on the unweighted results and this suggests that the samples were representative of the populations from which they were drawn, at a socio-economic level. This would suggest that withdrawal of co-operation by schools, parents or pupils was not associated with socio-economic measures.

In previous surveys the response rates of 75.0% and above have been achieved and considered by BASCD to provide sufficient confidence to enable publication and comparison with the results of previous surveys. In England during 2008/09, the response rate was 74.1% and therefore national level comparisons with previous surveys can be made with reasonable confidence.

Response rates vary at the SHA, PCT and LA level. Across SHAs the response varied from 69.1% in East of England to 78.2% in London. On a PCT level it varied from 46.9 % in Norfolk to 89.7% in Newham, therefore when looking at PCT/LA level data the response rates need to be considered before making comparisons.

The results showing reducing levels of disease are in alignment with those found in previous years. The geographic distribution of disease levels is also consistent with previous surveys. The northern SHAs, Yorkshire and The Humber, North West and North East show higher prevalence and severity of disease than SHAs in the Midlands and the South West. The more southern and easterly SHAs, South Central, South East Coast and London, along with East of England, have the lowest levels of disease.

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ISBN: 978-1-908029-02-7 (Web version)



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