

# The equity of access to primary dental care for children in the North East of England

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**Objectives** To determine the equity of access to dental care from general dental practitioners for children aged 0 to 17 years. **Basic research design** Postcode data was obtained from the Dental Practice Board for children registered with an NHS dentist. There were 146,180 children aged 0 to 17 years old resident in the study area, these were mapped to their ward of residence. The child registration rate for wards was calculated, using 2001 census data. The level of deprivation for wards was obtained using a standard indicator, the Index of Multiple Deprivation. **Setting** The Durham and Tees Valley Strategic Health Authority area in the North East of England. The Authority has a population of 1.13 million, of which 260,000 were aged 0 to 17, in 2001. There are approximately 170 dental practices in the Authority area contained in 251 Wards. **Results** The range of child registration rates in wards was, 11% to 90%. There was a significant negative association between the number of children registered with a dental practice and increasing deprivation. For every 10 point increase in the deprivation score the probability of registration reduced by 5% of the overall rate. The probability of registration reduced less in those wards with a dental practice compared to those without a dental practice with increasing deprivation. **Conclusions** There are significant inequalities in access to dental care. Children living in deprived wards access general dental practices less than those living in wealthier wards. The location of dental practices may reduce inequalities in access.

*Key words:* access, children, dental services, deprivation, equity

## Introduction

The UK Government's Health Service Plan published in 2000 highlighted the problems of inequalities in access to state funded health services. It accepted that there was an inverse case law (Hart, 1971), where communities in greatest need are least likely to receive the health services that they require, (Department of Health, 2000). A continued commitment to reducing inequalities, including those in oral health was made by the government in 2003 in the document "Tackling Health Inequalities A Programme for Action" (Department of Health, 2003). In 2004 all Primary Care Trusts in England were required to assess their use of health equity audits as a tool to reduce health inequalities and ensure equity, which is a fundamental principle of the NHS (Johnson, 2004)

The prevalence of dental disease in both adults and children is recognised as being higher in those individuals from lower social classes (Kelly *et al.*, 2000). The 1993 Children's Dental Health Survey showed that the majority of children accessed the General Dental Service for treatment and only a small proportion received their care from other service providers (O'Brien, 1994a). The 1993 Survey also showed that higher levels of dental disease were experienced by children from lower social classes and those who attend infrequently for dental care compared, to other members of the population (O'Brien, 1994b). Work in the North East has demonstrated that increasing deprivation is associated with increasing levels of dental disease amongst children (Provant and

Carmichael, 1995).

Major reforms of primary care dentistry are scheduled to take place by April 2006 in the United Kingdom. These have been set out in a number of Government publications. The national contract for general dental practitioners will be replaced by local contracts for service provision, held by Primary Care Trusts. These reforms, also contain a commitment to ensure that NHS dentistry is available to all who want it, and that action will be taken to address inequalities in oral health (Department of Health, 2002). The aim of this study was to determine the equity of access to primary dental care for children in the North East of England. The objectives were to use the registration data for children attending general dental practices in the Durham and Tees Valley Strategic Health Authority area as a proxy for access to primary dental care and to determine the relationship with material deprivation at an electoral ward level, using the Index of Multiple Deprivation 2000 (Department of the Environment, Transport and the Regions, 2000).

The study took place in the Durham and Tees Valley Strategic Health Authority area in the North East of England. The Authority had a population of 1.13 million, of which 260,000 were aged 0 to 17, when the 2001 UK Census took place. The mean dmft for the 5 year old population in the two former constituent, health authorities were 1.93 dmft for County Durham and Darlington and 1.81 for Tees in 1999/2000 (Pitts, Evans and Nugent, 2001).

## Methodology

The data for the study was obtained from the Dental Practice Board who supplied a data set of child registrations by postcode, for the quarter ending March 2003. The 2001 Census data was used to determine child ward population levels (Office of National Statistics, 2003).

The data set supplied by the Dental Practice Board was used to identify the numbers of registrations for children in each ward of the Primary Care Trusts in the Durham and Tees Valley, Strategic Health Authority. The number of children in wards, were divided by the total child population to give the percentage registration rate in each ward.

The deprivation scores for all wards were identified and divided between those wards with and without dental practices. Information on dental practice location was obtained from County Durham and Tees Valley Primary Care Shared Services. Deprivation levels for wards were measured using the Index of Multiple Deprivation (IMD) produced by the Department of the Environment, Transport and the Regions in 2000. The index is made up of 32 separate indicators divided into six domains, each of which is given a weighting. These are Income 25% Employment 25%, Health 15%, Education 15%, Housing 10% and Geographic Access 10%.

A scattergram was produced to demonstrate any crude relationships between ward registration rate and IMD, showing wards with and without dental practices in them. Trend lines were added to the two data series.

The relationship between access to care and deprivation was further investigated using negative binomial regression procedures. The dependent variable was the number of children aged 0-17 registered with a general dental practice. The log of the total number of children aged 0-17 resident in the ward was included in the model as an offset to allow for the different population of each ward. To estimate the strength of the association between access to care and deprivation, the IMD was included as an explanatory variable. A binary indicator variable which took the value 1 for wards that included a general dental practice and 0 for other wards was then included to see whether there was a difference in the level of access to care between the two types of ward. Finally an interaction between these two explanatory variables was included to determine whether the association between registration levels and deprivation was the same in the two types of ward. In order to facilitate interpretation of the regression model, the deprivation score in each ward was divided by 10.

## Results

The wards' registration rates ranged from 11% to 90%, the median group interval of registration for children at ward level was between 60% and 70% (Figure 1). The scattergram showed a decline in registration rate as ward deprivation increased. The trend lines showed that registration rates declined less for those wards with a dental practice(s) located in them compared to those without a practice (Figure 2).

Negative binomial regression indicated a significant negative association between the number of children

registered with a general dental practice and IMD score. The relative risk corresponding to an increase in 10 in deprivation score was 0.95 with 95% Confidence Interval: 0.93-0.97. Adding ward type to the model suggested that children resident in a ward that included a general dental practice might be more likely to be registered with a general dental practice than other children the relative risk = 1.06 with 95% Confidence Interval: 0.99-1.12. Including an interaction between ward type and IMD suggested that association between the number of children registered with a general dental practice and deprivation differed between the two types of ward ( $p = 0.05$ ). The relative risk corresponding to an increase in deprivation score of 10 in a ward including a general dental practice was 0.96 with 95% Confidence Interval: 0.94 - 0.98. The corresponding relative risk in other wards was 0.93 with 95% Confidence Interval: 0.91 - 0.96. The ratio of these relative risks was 1.03 with 95% Confidence Interval: 1.00-1.06 and the p-value associated with the test that ratio differed significantly from 1 was 0.05.

## Discussion

There was strong evidence of an association between the number of children registered with a general dental practice and the deprivation index. For each increase in 10 units for the IMD the probability of a child being registered was reduced by approximately 5%, thus an increase of 10 in IMD score between two electoral wards would correspond to a drop in registration rate from 40% to 38%, being 5% of 40% in this model.

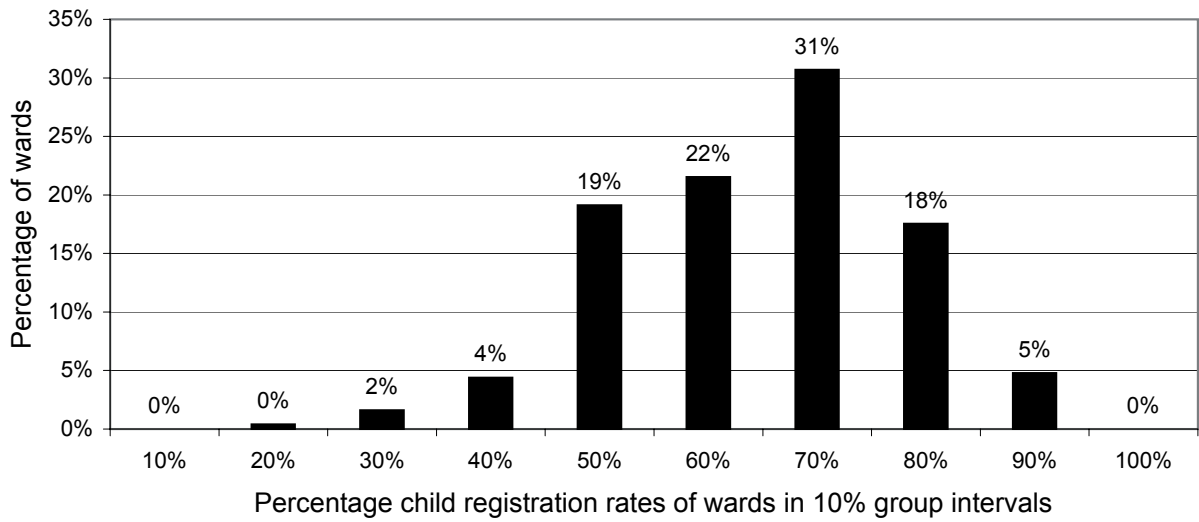
There was an identified difference in access to care between those wards with and without a dental practice. A dental practice in a ward was associated with improved access for children.

The geography of the study area may have influenced access as parts of County Durham are very rural in nature compared to the densely populated areas around Teeside. Consequently wards are much smaller in urban areas with distances across ward boundaries of much less than a mile, compared to the rural areas where boundaries can be many miles apart.

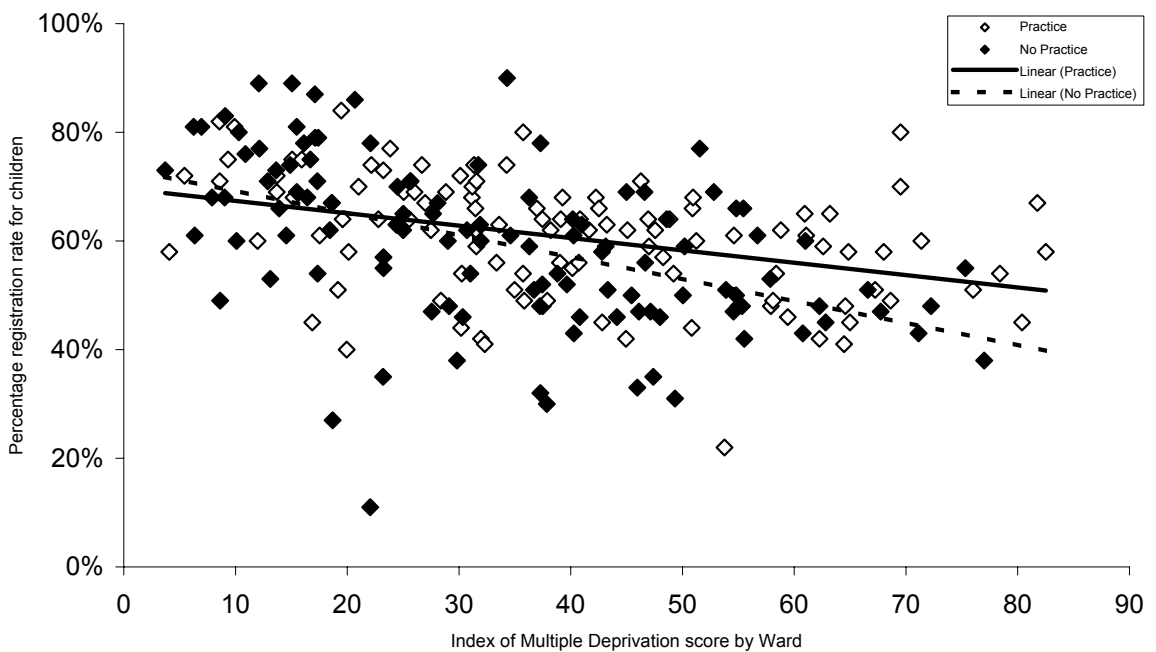
The use of registration rate to measure access has deficiencies, as it simply measures the proportion of children who have attended an NHS dentist, and then enter into a formal agreement for care, whereby the dentist will receive fees for undertaking a level of responsibility for a 15 month period. The patient may attend for a number of episodes of treatment or just one attendance and could subsequently fail to complete a course of treatment.

The levels of registration alter with different time periods due to numbers of registrations lapsing after 15 months and new registrations being made. We were restricted to the data set period as that was the most up-to-date available, when the study started.

The data used in this study was for the period ending April 2003 while the data used to determine the size of the child population in each ward was from the 2001 census. Consequently wards with small numbers of children, house moves of large families and new residential building, could have altered the figures in wards. The data set provided by the Dental Practice Board is based upon data collected from dentists who's practices



**Figure 1.** Percentage of wards and percentage registration rates of children in Durham and Tees Valley StHA



**Figure 2.** Scattergram showing the relationship between the IMD score of wards and child registration rates for wards with and without a dental practice in them.

are located in the Strategic Health Authority area. The Dental Practice Board data had 8% more registrations within it than we were able to map to Authority postcodes. This was made up of children who lived outside the Authority area but attended one of the study practices or the postcode was unidentifiable. Conversely resident children who attend dental practices outside the Authority area would not be recorded, leading to artificially lower registration rates.

Wards' boundaries are under regular review which meant that since the Index of Multiple Deprivation was published in 2000 ward changes have taken place. This meant that it was only possible to map 224 wards in 2003 to deprivation scores out of a total of 251 within the Authority.

The study did not link childrens registration rates to individual practices hence it is not possible to determine which practices provide care for children from which wards or even if they draw their catchment populations from where they are located. The dental practices were identified at a ward level only and may have been situated at the geographic edge of a ward, or bounding a multiple of other wards which would have an effect on the geographic access to services for some of the study population.

The results of this study must be treated with caution as there will be many separate factors, other than children's family socio-demographic background which effect the uptake of dental services for children. Dental practises may not welcome children or only provide NHS care if the parents register under private contract.

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## Conclusions

There is inequity in the access to primary dental care for children in the North East of England. The data shows that children from poorer sections of the community access dental services less than those from wealthier areas, even through they are most likely to have the highest need for dental care. Dental practice location does aid in improving access to dental care for those children from deprived backgrounds.

The move to local contracting for dental care by April 2006 will provide an opportunity to reduce inequalities in access. The freedom of local contracting will enable Primary Care Trusts to work with practices at a community level to increase uptake of dental services. The government's investment in schemes to reduce inequalities for children from socially disadvantaged groups through SureStart programmes and the development of Childrens Centres provide resources which can be utilised to facilitate uptake of dental care, while local contracting can ensure that there are no financial barriers to dentists who provide access to dental care for children from disadvantaged backgrounds.

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