



Powys Teaching Health Board

Dental caries in 5 year olds 2007/08 and 2011/12

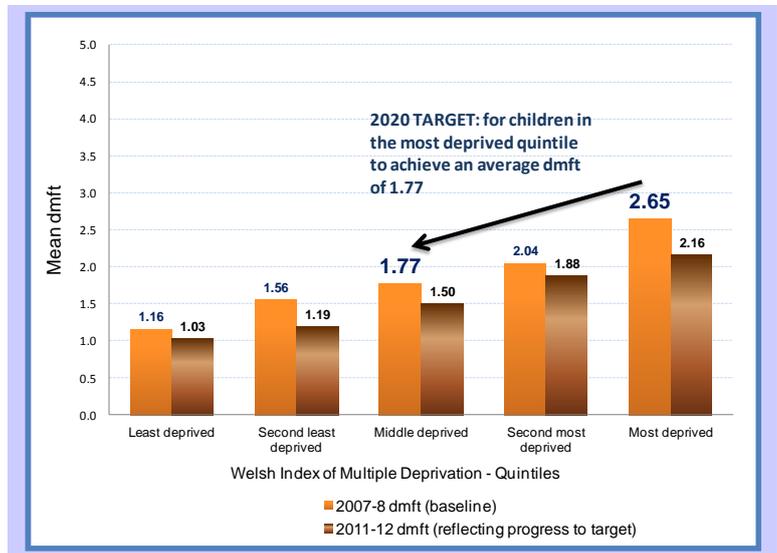
The 2013 Oral Health Profile for Powys Teaching Health Board presents oral health data for school year 1 (approximately 5 years of age) generated from a survey undertaken during the winter of 2011/12 and compares it with the previous survey carried out in 2007/08. This profile focuses on local health board (LHB), unitary authority (UA) and upper super output area (USOA) analyses. For Wales's level data see the "Picture of Oral Health" at the Welsh Oral Health Information Unit (WOHIU) website.

This is the first comparison of data collected via formal written parental consent, as two sets of data are now available incorporating this approach. Before 2007/08 child oral health surveys used passive consent; this methodological change prohibited analysis of trends as data was no longer comparable.

Key messages

- ◆ Preventable decay levels showed signs of improvement in Powys 5 year olds
- ◆ Powys 2011/12 decay levels were lower than the Welsh averages
- ◆ However, there has been a widening of inequalities in health board dental health indicators underpinning national child poverty targets

Figure 1 Average dmft¹ for 5 year olds in 2007/08 and 2011/12 in Wales, by quintiles of the Welsh Index of Multiple Deprivation



Progress towards National oral health target

One goal of national oral health policy is to reduce inequalities experienced in children's oral health. Progress towards this goal is assessed by monitoring trends recorded by child oral health surveys. There are Wales's level targets for 5 and 12 year olds. For 5 year olds, the aim is to improve the average dmft and the percentage with caries, for the most deprived fifth as at 2007/08 to match the

¹ The average number of decayed, missing and filled teeth (dmft) is a measure of the decay experience in children. It is therefore the burden of disease which theoretically could have been prevented and thus key data for evaluation of efforts to prevent decay.

caries levels experienced by the middle fifth in 2007/08, by 2020. For the most deprived fifth of 5 year old children in Wales, the average dmft was 2.65 in 2007/08. The national child poverty target for 2020 is to bring this average down to 1.77. In 2011/12 the average dmft for the most deprived fifth was 2.16; half a tooth reduction when compared with 2007/08 and good progress towards the 2020 target (Figure 1).

The results of the Wales 2011/12 survey of 5 year olds suggest that prevalence of dental caries is improving but this needs to be confirmed by reviewing the results of future surveys, the next being scheduled for 2015/16.

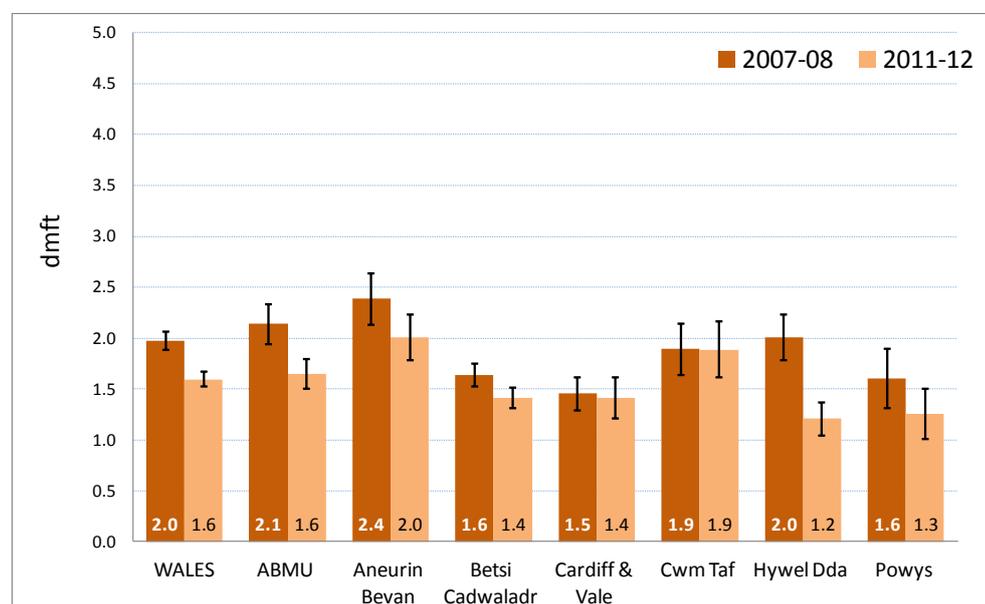
These targets are **Welsh targets**; to date there are **no** health board targets. But, this oral health profile does give an indication of changes to oral health within the Powys Teaching health board area.

Local Health Boards (LHBs)

PREVENTABLE DECAY

The sum of decayed, missing and filled teeth is a measure of the decay experience of the average child. It is the burden of disease which theoretically could have been prevented. Average dmft scores for Wales and Welsh local health boards in 2007/08 and 2011/12 are presented in Figure 2. For Wales, there was a statistically significant reduction in average dmft, the values were 2.0 (95%CI²: 1.9-2.1) and 1.6 (95%CI: 1.5-1.7) respectively. Hywel Dda, Betsi Cadwaladr and Abertawe Bro Morgannwg University health boards also experienced statistically significant reductions in average dmft.

Figure 2 Average dmft for 5 year olds, Welsh local health boards, 2007/08 compared with 2011/12



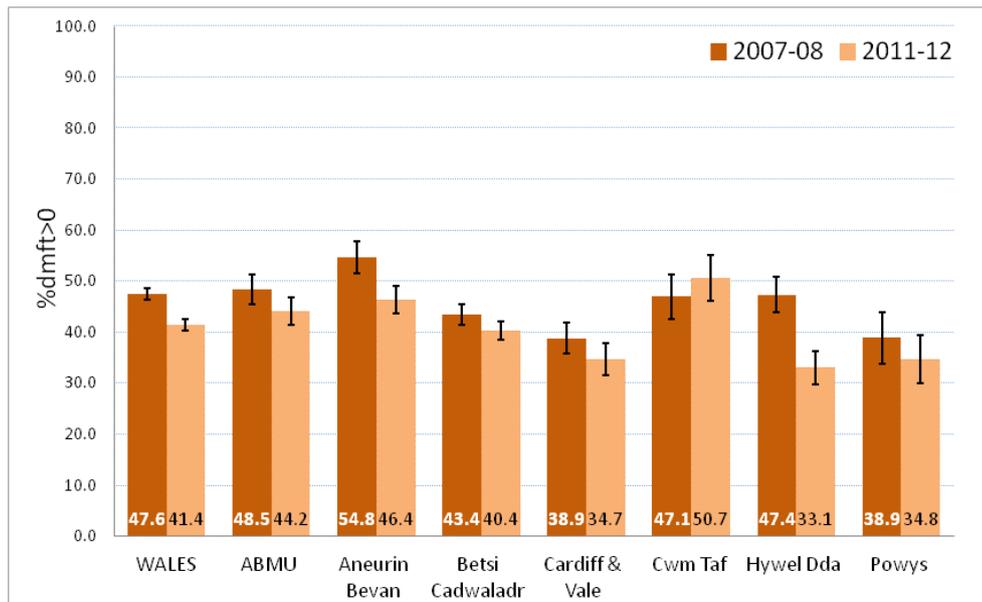
In Powys the averages were 1.6 (95%CI: 1.3-1.9) and 1.3 (95%CI: 1.0-1.5) respectively, but this was not a statistically significant reduction. Although, the 2011/12 Powys average was statistically lower when

² 95%CI represents the 95% lower and upper confidence intervals. A confidence interval constitutes a range of values for a variable of interest, e.g. mean dmft, constructed so that this range has a specified probability of including the true value of the variable. So a 95% confidence interval has a 95% probability of including the true value.

compared with the Welsh average for the same survey (1.6, 95%CI: 1.5-1.7, Figure 2).

Figure 3 illustrates the proportion of children with at least one decayed tooth (%dmft>0) for Wales and Welsh LHBs. There was a significant reduction in the proportion of Welsh 5 year olds with decay (%dmft>0) between 2007/08 and 2011/12, the values were 47.6% (95%CI: 46.4%-48.7%) and 41.4% (95%CI: 40.3%-42.5%) respectively. It is encouraging that more children have no obvious decay experience by age 5 (Figure 3).

Figure 3 Percentage of 5 year olds with caries experience (%dmft>0), Welsh local health boards, 2007/08 compared with 2011/12



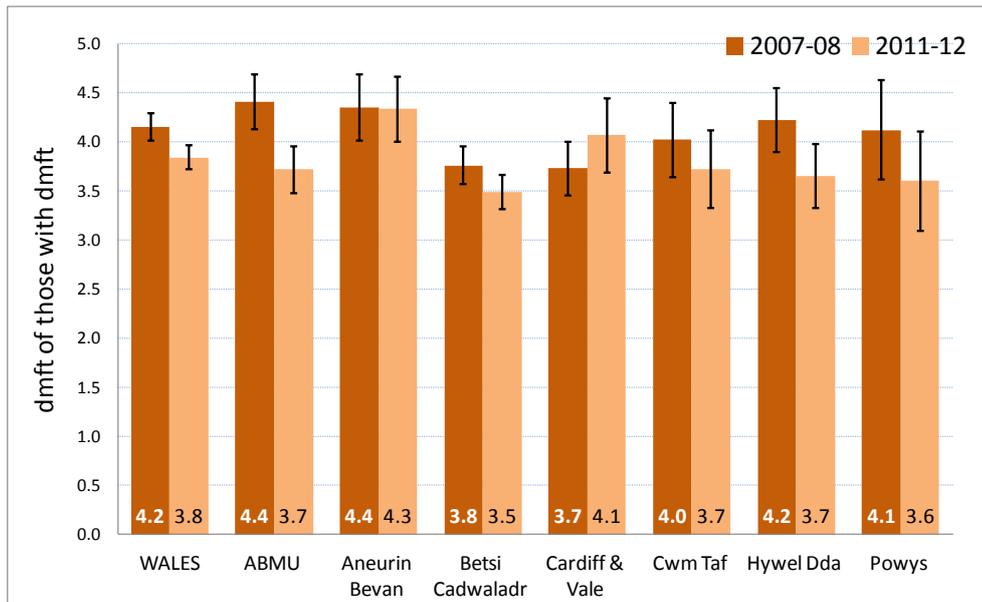
From a health board perspective, there appears to be a tendency (except in Cwm Taf) for a reduction in the proportion of children with decay experience, but the changes only reach statistical significance in Aneurin Bevan and Hywel Dda LHB areas (Figure 3).

Powys experienced a reduction, approximating to 4%, in the %dmft>0 between 2007/08 (38.9%, 95%CI 33.9%-43.9%) and 2011/12 (34.8%, 33.9%-43.9%). However, because of the wide confidence intervals linked to smaller sample sizes, this change was not statistically significant (Figure 3). The 2011/12 Powys %dmft>0 was statistically lower when compared with the Welsh percentage for the same survey.

Looking only at those children who have at least one decayed, missing or filled tooth illustrates the stark differences between children with decay and those without. The average dmft for a child with dmft is shown in Figure 4. For Wales overall, the reduction from 4.2 in 2007/08 (95% LCI 4.0 – 95% UCI 4.3) to 3.8 in 2011/12 (95%LCI 3.7 – 95% UCI 4.0) does suggest an improving position.

For Welsh health boards, there is a tendency for a reduction in the mean scores, but the only change which reaches statistical significance is in ABMU where the averages for 2007/08 and 2011/12 were 4.4 (95%CI: 4.1-4.7) and 3.7 (95%CI: 3.5-4.0) respectively (Figure 4).

Figure 4 Average dmft of those with caries experience for 5 year olds, Welsh local health boards, 2007/08 compared with 2011/12



Powys experienced a reduction (representing a half of a tooth) in the average dmft of those with dmft between the two surveys. The 2007/08 and 2011/12 averages for Powys were 4.1 (95%CI: 3.6-4.6) and 3.6 (95%CI: 3.1-4.1) respectively. However, because of the wide confidence intervals linked to smaller sample sizes, this change was not statistically significant. Further, the Powys 2011/12 average was within the Welsh average range for the same survey.

ACTIVE DECAY

The decayed teeth (dt) component of total experience of decay (dmft) measures active decay. This puts the child at risk of pain, infection and suggests risk of decay of permanent successor teeth. In the past it has been called untreated disease.

The concept of treating all decay in deciduous teeth by providing fillings or extractions is being questioned and researched. Children with decay need to reduce the consumption of sugar in their diets, carry out supervised toothbrushing with fluoride toothpaste and have regular application of fluoride varnish by dental professionals, as opposed to operative dental procedures. Thus dt data is now regarded as a marker for children/families who need support in managing this chronic dental disease.

Between 2007/08 and 2011/12 there was a statistically significant reduction in average dt for Wales, the values were 1.4 (95%CI: 1.3-1.5) and 1.08 (95%CI: 1.0-1.1) respectively (Figure 5). Only Betsi Cadwaladr and Hywel Dda showed statistically significant reductions in average dt scores between 2007/08 and 2011/12 (Figure 5). In 2011/12 average dt ranged from 0.8 in Hywel Dda to 1.5 in Aneurin Bevan LHB.

The average dt for Powys fell slightly between the two surveys from 1.2 (95%CI: 1.0-1.5) in 2007/08 to 0.9 (95%CI: 0.7-1.1) in 2011/12. However, because of the wide confidence intervals linked to smaller sample sizes, this change was not statistically significant. The survey averages for Powys were within the Welsh average range for the contemporaneous surveys (Figure 5).

Figure 5 Average dt for 5 year olds, Welsh local health boards, 2007/08 compared with 2011/12

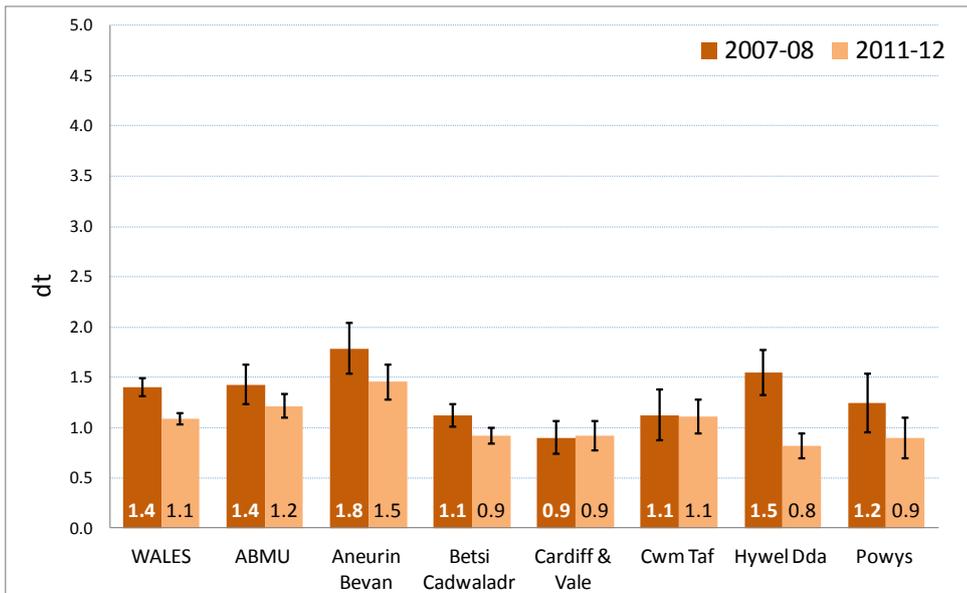
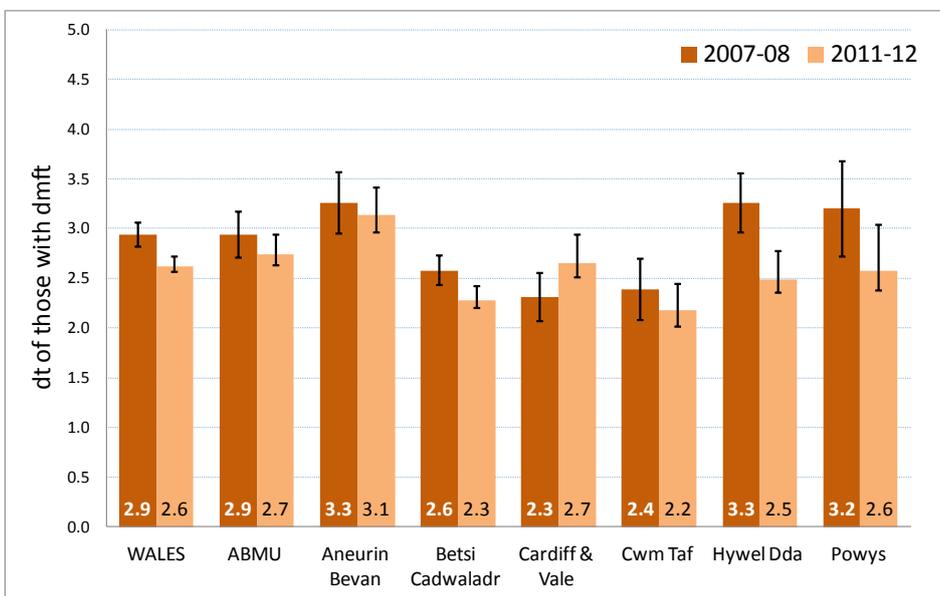


Figure 6 shows changes in average dt for those children with decay experience (i.e. those with at least one decayed, missing or filled tooth) between the two survey years for Wales and its seven constituent health boards. The average for Wales fell between 2007/08 and 2011/12 from 2.9 (95%CI 2.8-3.1) to 2.6 (95% CI 2.5-2.7). This statistically significant improvement represented a reduction of almost 1/3rd of a tooth (Figure 6).

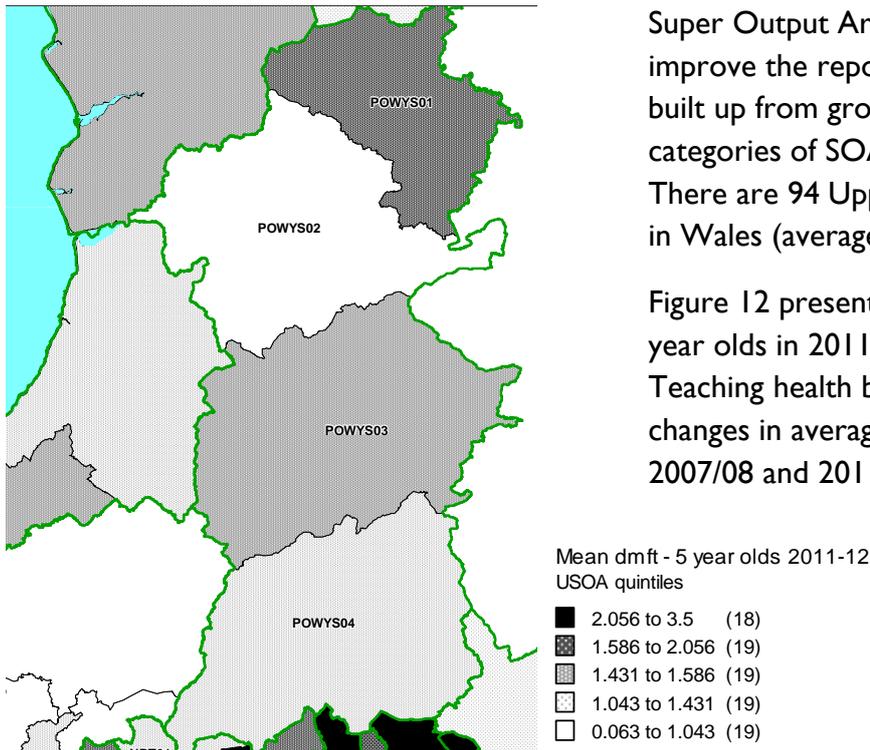
Figure 6 Average dt of those with any experience of caries (dmft) for 5 year olds, Welsh local health boards, 2007/08 compared with 2011/12



Only Hywel Dda and Betsi Cadwaladr experienced a statistically significant reduction. In 2011/12 the averages ranged from 2.2 in Cwm Taf to 3.1 in Aneurin Bevan. The average dt for those with experience decay in Powys exhibited a reduction (representing just over half a tooth) between 2007/08 (3.2, 95%CI: 2.7-3.7) and 2011/12 (2.6, 95%CI: 2.1-3.0). However, because of the wide confidence intervals linked to smaller sample sizes, this change was not statistically significant (Figure 6). The 2011/12 average for Powys was within the Welsh average range for the same survey.

Upper Super Output Areas (USOAs³)

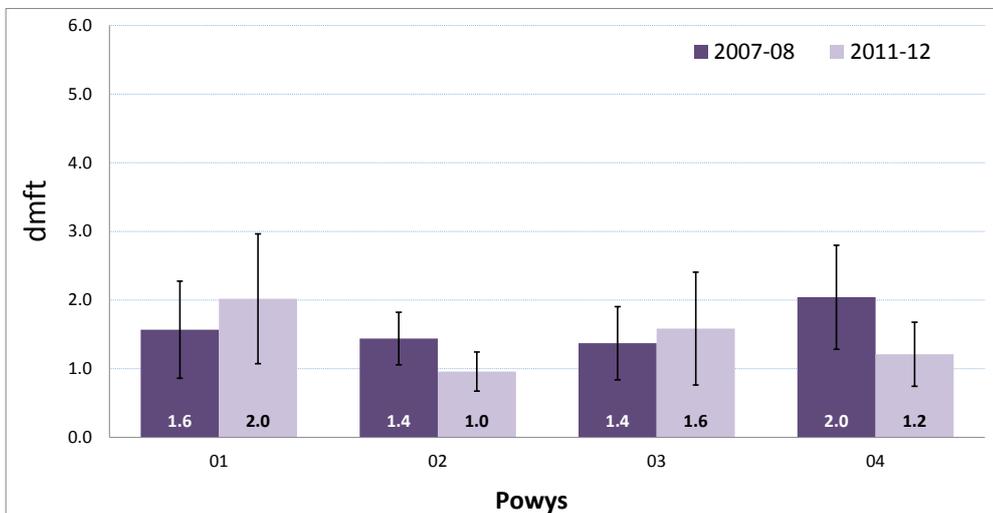
Figure 12 Average dmft for 5 year olds in Powys Teaching HB USOAs, as at 2011/12



Super Output Areas (SOAs) were designed to improve the reporting of small area statistics and are built up from groups of Output Areas. There are 3 categories of SOAs, i.e. lower, middle and upper. There are 94 Upper Super Output Areas (USOAs) in Wales (average population approx. 32,000).

Figure 12 presents a map of the average dmft for 5 year olds in 2011/12 for the USOAs in Powys Teaching health board. Figure 13 highlights the changes in average dmft for these USOAs between 2007/08 and 2011/12.

Figure 13 Average dmft for 5 year olds - USOAs within Powys 2007/08 compared with 2011/12



There are 4 USOAs in Powys, the dmft in 2011/12 ranged from 1.0 in Powys 02 to 2.0 in Powys 01. There was a notable reduction in the average dmft for Powys 04, from 2.0 in 2007/08 (95%CI: 1.3-2.8) to 1.2 in 2011/12 (95% CI: 0.7-1.7). But because of the small sample sizes at USOA level and the associated wide 95% confidence intervals this was not a statistically significant change.

³ USOAs constitute a statistical geography produced by the Data Unit Wales, based on a set of Super Output Areas produced by the Office for National Statistics. USOAs have been designed to provide a geography of a similar population size that is more detailed than local authority but still large enough to allow a wide range of statistics to be produced, with each of the 94 USOAs in Wales having an average population of 32,000 people.

Inequalities in oral health, Wales and Powys Teaching HB

Although children's oral health has improved on average, inequalities remain. Caries, like many other diseases increases with social deprivation. In Wales, we have the child poverty targets to monitor inequalities in oral health.

Table 1: Mean dmft & %dmft>0 for 5 year olds by quintiles of deprivation index, for Wales and Powys Teaching Health Board

	5 year olds 2011-12				5 year olds 2007-08			
	WALES		Powys		WALES		Powys	
	mean dmft	%dmft>0	mean dmft	%dmft>0	mean dmft	%dmft>0	mean dmft	%dmft>0
Least deprived	1.0	31.3	1.3	40.7	1.2	34.5	1.2	34.2
Second least deprived	1.2	32.8	1.0	24.8	1.6	41.3	1.3	36.3
Middle deprived	1.5	41.4	1.3	34.3	1.8	44.1	3.7	50*
second most deprived	1.9	48.3	2.0	54.7	2.0	49.2	2.4	47.8
Most deprived	2.2	51.5	n/a	n/a	2.7	57.6	n/a	n/a
All within area	1.6	41.4	1.3	34.8	2.0	47.6	1.6	38.9
Ratio - most deprived:middle deprived	1.4	1.2	n/a	n/a	1.5	1.3	n/a	n/a
Ratio - second most deprived:middle deprived	1.3	1.2	1.6	1.6	1.2	1.1	0.6	1.0

*only based on six records

As outlined on page 1, the overall aim is to improve the average dmft and the % with caries for the most deprived fifth so that by 2020 they match caries levels experienced by the middle fifth, when the baseline was set in 2007/08. For most dental caries indicators for 5 year olds, Powys experienced small but not statistically significant reductions between the surveys conducted in 2007/08 and 2011/12. But, these reductions appear to have taken place in the three least deprived quintiles (Table 1). Across Wales the ratio of the most deprived:middle deprived is used as an indicator of progress for the Child Poverty Targets. In Powys there were no children from the most deprived quintile taking part in these surveys of 5 year olds. Therefore, for Powys it is necessary to consider the ratio of the second most deprived: middle deprived, where it appears there has been a widening of inequalities as the ratios have increased over time. For example, for dmft the ratio was 1.1 in 2007/08 compared with 1.6 in 2011/12.

There is no need for complacency as dental caries is a preventable disease; two fifths of children aged 5 still experience of decay in the health board area. Improvements need to be made to mirror the decay experience of children in similar areas of Scotland – where the Child Smile initiative appears to be reaping benefits.

USEFUL WEBSITES

Welsh Oral Health Information Unit	http://www.cardiff.ac.uk/dentl/research/themes/appliedclinicalresearch/epidemiology/oralhealth/index.html
PHW observatory	http://www.wales.nhs.uk/sitesplus/922/home
British Association for the Study of Community Dentistry	http://www.bascd.org/
Designed to Smile	http://www.designedtosmile.co.uk/ <u>Home page</u>
Child Smile	http://www.child-smile.org.uk/index.aspx <u>Results from the recent evaluation</u> http://jdr.sagepub.com/content/92/2/109.full
Child Dental Health survey data	http://webarchive.nationalarchives.gov.uk/+/www.dh.gov.uk/en/Publicationsandstatistics/Bulletins/Chiefdentallofficersbulletin/Browsable/DH_4860753
Adult Dental Health survey data	http://www.hscic.gov.uk/pubs/dentalsurveyfullreport09
Health Maps Wales	http://www.infoandstats.wales.nhs.uk/page.cfm?orgid=869&pid=40976